

THE
**SURGICAL INSTRUMENTS
OF THE HINDUS**

WITH

**A Comparative Study of the Surgical Instruments of
the Greek, Roman, Arab and the Modern
European Surgeons.**

BY

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Saraswati, Sastra-vachaspati,
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Chairman of the Board of Sanskrit Studies,

In recognition of his love of Science, his pre eminent services to the cause
of University Education, his administrative ability, and his generous
liberality to scholars

AS WELL AS

In grateful remembrance of many acts of kindness,

THIS VOLUME IS

DEDICATED

BY

THE AUTHOR

PREFACE.

For researches into the state of medicine among the Ancient Hindus, we have several sources of information to scrutinise. The remarks of Dr Payne regarding the sources of information of Anglo-Saxon Medicine may apply here with still greater force ¹

First is the evidence of contemporary literature about the craft of physicians and surgeons, since we are sure that there has always been a class of medicine men of one kind or another. Thus we find in the Rgveda, the use of artificial limb as a substitute for a limb accidentally lost². From the Mahābhārata,

¹ Payne's English Medicine in the Anglo Saxon Times, P 7.

² चरित्रं हि वैरिवाच्छेदि पर्णम्
आजा खेलस्य परितक्मप्रायाम् ।
सद्यो जङ्गामायसी विशपलायै
धने हिते सत्तवे प्रत्यधत्तम् ॥

Rgveda—15th Rk, 1st Mandala, 116 Sūkta

अगस्त्य पुरोहित खेलौ नाम राजा तस्य सम्बन्धिनी विशपलानामस्त्री, सग्रामे शत्रुभिः क्षिन्नपदा आसीत् । पुरोहितेन अगस्त्येन स्तुतौ अश्विनौ रात्रौ आगत्य आग्रामे पाद समधत्तम् । तदतदाह 'आजा'—आजा, सग्रामे, अगस्त्य पुरोहितस्य—खेलस्य राजत सम्बन्धिन्या, विशपलाय्याया, 'चरित्र'—चरण, 'वैरिव'—वे पक्षिण, 'पर्ण' पतत्रम् इव, 'अच्छेदि हि'—पूरा क्षिन्नमभूत् खलु । हे अश्विनी । युवा अगस्त्येन स्तुतौ सन्तौ, 'परितक्मप्रायम्'—रात्रौ, आगत्य, 'सद्य'—तदानीमेव, 'सत्तवे'—सर्तू गन्तुम् इत्यर्थ, विशपलायै 'आयसी',—लौहमयीम्, 'जङ्गाम'—जङ्गीपलक्षित पादम्, 'प्रत्यधत्तम्'—सन्धानम् एकीकरणमित्यर्थं कृतवन्तौ ।

we learn that when Parikṣit, the king of the Kurus, became certain of his approaching death by snake-bite, due to a curse uttered by a sage, he tried to protect himself by the constant attendance of a number of physicians, who were well supplied with antidotes.¹ Again it is stated that when the great warrior Bhīṣma was wounded in war, the skillful army surgeons came to him with the necessary medical and surgical appliances to treat his wounds.—From the Mohāvāgga, we learn that Jīvaka, the personal physician of Buddha, practised cranial surgery with success.² In the Mālavikāgnimitra, we find the use of charms—a signet

- ¹ समन्त्रं मन्त्रिभिर्यव स तदा मन्त्राद्वदित् ।
 प्रासादं कारयामास ण्कमग्नं मन्त्रितं ।
 रक्षां विदधे तत्र भिषज्जर्मापधानि च ।
 ब्राह्मणान्मन्त्रसिद्धांश्च सज्जती यन्मयीजयत् ।

Mahābhārata, Adī Parva, Ch 12

- ~ उपातिष्ठन्नथी वेद्या शब्धीद्वरणकीविदा ।
 सर्व्वोपकरणैर्युक्ता कुण्ठे साधु शिचिता ।
 तान् दृष्ट्वा जान्हवीपुत्र प्रीवाच तनय तव ।
 धनं दत्त्वा विसृज्यन्ता पूजयित्वा चिकित्सका ।
 एव गते मयेदानीं वैद्यैः काव्येभिस्मास्ति किं ।
 चतुर्धर्मैः प्रशस्ता हि प्राप्तीऽस्मि परमा गति ।
 नैष धर्मो महीपाला शरतल्पगतस्य मे ।
 एभिरेव शनैश्चाह दग्धव्योऽस्मि नराधिपा ।
 तच्छ्रुत्वा वचनं तस्य पुत्तो दुर्योधमस्तव ।
 वैद्यान् विसर्ज्जयामास पूजयित्वा यथाऽर्हत ।

Mahābhārata, Bhīṣma Parva, Ch 121,

Vs 5745—5750 (A S B. Ed.)

ring as a healing talisman for the cure of snake-bite,¹ and also we find there a reference to a class of physicians who specialised themselves in Toxicology (Visa-Vaidya),² and were held in high esteem for their professional skill by the public.³ From the Bhojaprabandha, the administration of some kind of anæsthetic by inhalation before surgical operations can be ascertained. Similarly from the books of Law, we know the relations of the profession to society in general. In the Manusamhitā, we have unmistakable testimony of the decline of Hindu surgery as the author prohibits the eating of cooked rice from the hands of a surgeon.⁴

¹ सहि । देवीए इद सिपिसआसादी आनीदखागमुद्दसणाह अङ्गुलीअस सिणिद्ध पिभालअन्ती तूह उवालभे पडिदह्नि ॥

Milavakīgnimitra, Ch I.

जय ।—जेदु जेदु भट्टा । धुवसिद्धी विस्वेदी । उदकुम्भविषाणेण सप्पमुट्ठिआ कप्पिदव्वा । ता अण्णेसीअदुत्ति । धारि ।—एद सप्पमुट्ठअम् अङ्गुलीअसम् । पच्छा मह हत्वे णम् ।

Ibid, Ch IV.

² परि ।—हेदी दशस्य दाही वा जतस्थारक्तमीजणम् । एतानि दट्ठमात्राणा-
मायुष्या प्रतिपत्तय' ॥ (सप्रति विषवैद्यानाम् कर्मम् ।)

राजा ।—जयसेने । धुवसिद्धि चिममाहयताम् ॥

Ibid, Ch. IV.

³ निपु ।—पसणमुहवणी दीसदि । अवि अ धुवसिद्धिणा चिइस्सिदी । मा से असङ्गणिज्ज पाव ॥

Ibid, Ch. IV.

⁴ चिकित्सकान्देवलकान्मासविक्रयिणमथा ।

विपणेन च जीवन्तो वर्जा न्युर्ह्यव्ययो ॥

Manusamhitā, Ch. III, 152.

चिकित्सकस्य मृगयो क्रूरस्योच्छिष्टभोजिन ।

उयात्र स्तिकात्र च पर्याचान्तमनिर्दग्म् ॥

Ibid Ch. IV 212.

Secondly, monuments or inscriptions scattered about the country have to be searched, as references found therein to the science of medicine, are more trustworthy than documents which may have been more or less tampered with by interpolations of subsequent writers. Thus we learn from the Edicts of Asoka, that hospitals were established by him in different parts of his kingdom, not only for the treatment of suffering humanity but also for the brute creation¹.

Thirdly, personages and scenes in connection with medical practice, and figures of herbs may have been represented in works of art which must be thoroughly examined. But unfortunately we do not possess any such work of art and so we can learn nothing to our purpose from this source. In the interpretation of the subject of the Friezes of the Rani Naur and Ganesha's Cave, Dr R L Mitra says,—“The shampooing in the Ganesa Cave may be for a patient, but the close seat with the right hand round the neck of the male personage in the other, would be highly unbecoming in an unmarried female. But if the stooping figure be taken to be that of a wounded man, a wounded priest for instance, the lady may be a maiden nursing him without any offence to propriety. It is true that the appearance of the figure on the mattress does not indicate suffering from a wound, but in the Rani Naur frieze, the stooping head affords some indication of it”-

पुय चिकित्सकस्यात्र पुश्यास्त्वद्रमिन्द्रियम् ।

विडा वार्धूपिकस्यात्र शस्त्रविक्रयिणी मलम् ॥

Manusamhitā, Ch IV, 220

¹ Rock Inscriptions, Edict II

² The Antiquities of Orissa, Vol II, p 11

Fourthly, the various kinds of surgical instruments preserved in museums are to be examined and the reports of finds of surgical appliances in various localities are to be studied. We know what a flood of light has been thrown on ancient Greek surgery by the steady progress of archaeological discovery and finds of instruments at Pompeii, Herculaneum and elsewhere, and by the study of the specimens preserved in the Naples museum, the Athens museum and other museums of Europe. But as far as I have been able to trace, our museums contain no finds supplying us with any information on the subject.

Fifthly, the literature of medicine itself should be thoroughly inquired into and excerpts elucidative of our subject should be compared with one another. "The detailed descriptions of the very numerous Hindu instruments not being very minute or precise, Professor Wilson says, we can only conjecture what they may have been, from a consideration of the purport of their names, and the objects to which they were applied, in connection with the imperfect description given"¹. We are fortunate, however, in possessing a copious medical literature of great merit from very early times. We shall describe the important books in the introductory chapter, with short notices of their authors.

Sixthly, the comparative study of the science at the same period in other countries also furnishes us with valuable materials as regards the state of medicine in a country. It is well known that Sanskrit works are often written in a very terse language

¹ Royle's *Antiquity of Hindu Medicine*, foot note p. 712.

and it might be said with greater truth about the works of early Sanskrit authors, the comment of a learned critic about the style of Thucydides, the famous historian,—“the most obvious and characteristic of his peculiarities is an endeavour to express as much matter as possible in as few words as possible, to combine many thoughts into one, and always to leave the reader to supply something of his own. Hence his conciseness often becomes obscure.” I could not form any idea as to the shape of some of the surgical instruments from the descriptions given in the text books, and the commentators are often silent on those passages. But when I read the accounts of similar instruments in Greek and Roman literature, my difficulties at once cleared up. We know with what brilliant results comparative mythology and comparative philology have been studied of late years, and I am sure that a comparative study of medical science by scholars will lead to interesting discoveries. So I have added descriptions of the instruments according to the Greeks, Romans and Arabs at the end of the descriptions given in Sanskrit books—the former serving as commentaries on the latter.

Seventhly, in the accounts of historians, travellers and pilgrims from foreign countries, may be found notices of medical science, as they saw it practised during their sojourn in a country, and such impressions, if properly collated, may bear impartial testimony to the progress of the science at the time. Again, we must enquire if the original treatises of medicine can be proved to have been translated into different languages and whether the remedial agents of a country can be traced in the Pharmacopœias of different nations. Thus we

learn from the accounts of Houen Tsang and Fa Hian that charitable institutions such as hospitals, dispensaries and Pânyasālās (Houses of Charity) were quite common in ancient India¹ Arrian informs us in his *Indica* that the study of medicine among the Brahmans was in great favour² We know that the standard works on medicine were translated in Arabic in the 8th Century B C,³ and that various medicinal herbs of Indian origin found their way into the Greek *Materia Medica*⁴

Eightily, we must enquire whether the medical practice of ancient times is still resorted to by the physicians of the present days The Hindu system of medicine is still being practised all over India, more or less in its original form, and so can still be studied at first hand. But for our present purpose, we derive little or no help from the *Vedas* of the present generation They know practically nothing about anatomy and surgery which began to decline during the Buddhist era, and finally all vestiges of the science became lost during the Mahomedan rule I have spared no pains to exhaust these sources of information so far as surgical instruments are concerned Whether or not I have been fortunate enough to give just the necessary details of instruments from the best accessible authorities without at the same time loading my pages with superfluous matter, must be left to the judgment of my readers to determine

¹ Beal's Buddhist Records of the Western World, Vol I, P 165, 198 and 214, Vol II p 188 and 303

² Arrian's *Indica* c 27

³ Alberuni's *India* Sachau's Preface p XXX—XXXI

⁴ Royle's *Antiquity of Hindu Medicine*, p 77 II

Now it may be asked why the Science and Art of Surgery, which was 'successfully practised in Ancient India, is so much neglected by the present generation of *Varde*. So let us consider the causes that led to the downfall of Hindu Surgery

1 The Hindus from a very early period have given up the dissection of human bodies—the only trustworthy method of acquiring anatomical knowledge—merely because it may occasion ceremonial uncleanness. The Ancient Hindus were, however, free from such prejudices. Manu lays down that mere bathing will purify a Brahman who has touched a corpse,¹ whilst stroking a cow or looking at the Sun having only sprinkled his mouth with water will remove the defilement due to touching a dead bone. But even in the *Manusmriti*, we can trace the decline of Hindu surgery, and his law forbidding any one from eating food from the hands of a doctor evidently refers to a surgeon.²

2 The interference of the priests in India, as in Europe played an important part. They began to cure diseases by spells, charms, texts and drugs, and temples have served as consulting rooms for the treatment as much of the diseases

¹ दिवाकीर्त्तिमुदक्या च पतित सूतिका तथा ।

श्व तरस्पृष्टिन चैव स्पृष्टा स्नानेन शुध्यति ॥

The Institutes of Manu, Ch V, 85

² नार स्पृष्टास्थि सस्नेह स्नात्वा विप्रो विशुध्यति ।

आचम्यैव तु निस्नेह गामालभ्यार्कमौक्ष्यथा ॥

Ibid, Ch V, 87

³ Ibid, Ch III, 152, Ch IV, vs 212 and 220

of the body as of the soul. The example of such a temple we still find in Tārakesvar where many sick people repair to have their maladies cured by dreams, hypnotic suggestions and incubation or temple-sleep. Similar practice was prevalent in Egypt and Greece in olden times. The modern practice of using galvanic rings and abdominal belts is merely an advanced method of indulging in superstitious ideas.

3 The patients always dreaded the surgeon's knife—especially when the use of a general anæsthetic was unknown. At the same time, the comparative success of poultices, actual and potential cauteries, and other external applications have influenced the lay mind that operations by knife are not always needed¹. The Hindu surgeons themselves believed in similar tenets, for Suśruta, the surgeon, remarks that “of all cutting instruments and their substitutes, caustics (or vegetable alkalies) are the most important, because by means of them, deep and superficial incisions and scarifications may be made, and derangements of the three humours (air, bile and phlegm) may be rectified”, and again he says that “with

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- ¹ दिव्यीषधिं विना देविं शस्त्रविद्या सुनिष्फला ।
 वैरूप्यं कुरुते या च दुश्चिकित्सी व्यधानरे ॥
 जायन्ते हि यथार्णसि पाटितानि पुन पुन ।
 किं तत्र शस्त्रसाध्यं स्यात् सुसिद्धैर्भेषजैर्विना ॥
 धातुना व्यापदि यश्च भेषजं नैव सिद्ध्यति ।
 रागभये दुर्मते तस्मिन् शस्त्रमेव विधीयते ॥
 पुनः सशमनं तत्र धातुनाम् हि प्रशान्तिदे ।
 प्रदातव्यं सर्वादिभिः शस्त्रादन्वाक् ब्रवीमि ते ॥

regard to surgical treatment, actual cautery is said to be superior to caustics, in as much as diseases treated with the actual cautery do not reappear, and because it can cure diseases which are incurable by medicines, instruments and caustics"¹ Thus we see that the Hindus were partial to external applications as a cure of surgical diseases, and gradually they neglected the surgical operations—one of the most important means of acquiring knowledge in Morbid Anatomy and of testing the correctness of diagnosis, in the absence of the post mortem examinations of the cadavers. Thus not only surgery but medicine also suffered materially.

4 The Hindus always cherish a high regard for the writings of their sages, and the earliest works on medicine became the standard works and were held sacred. Any violation of their opinions was considered a sacrilege, and all knowledge thus soon became stereotyped. In later times, none dared to question the validity of the statements contained therein, and though about three thousand years have elapsed, and though the votaries of the science are still honoured and wellpaid, the science instead of improving has markedly deteriorated. In fact, only two authors—Caraka and Suśruta—are original, the later authorities—and there is a vast number of them—were merely their servile copyists who only differed from them when they indulged in some grave errors. We have a parallel in the history of medical science in Europe, where Galen

¹ चारादग्निर्गरीयान् क्रियासु व्याख्यानसद्गन्धाना रोगानामपुनर्भावाद्देयजगत्सुचारे-
साध्याना तत्साध्यत्वाच्च ।

held his sway over the profession for about two thousand years

5 One of the potent causes of progressive decadence in the knowledge and practice of surgery amongst the Hindus is the rapid spread of Buddhism in India. Though Buddha sanctioned the use of the lancet in some cases, in cases of a doubtful nature he prohibited the use of instruments in the treatment of even surgical diseases. For example, he allowed the surgical treatment of boils by knife,¹ but he prohibited not only the use of the lancet for treatment of fistula-in-ano but the use of clysters also.² As it would be interesting to know the reasons of this prohibition, I quote the story in full from the *Mohāvāgga* (Sacred Books of the East)³

1 Now when the Blessed One had remained at Sāvattthi as long as he thought fit, he went forth on his journey to Râgagaha, and wandering straight on he arrived at Râgagaha and there at Râgagaha he stayed at the Veluvana in the Kalandaka-nivâpa.

Now at that time a certain Bhikkhu was suffering from fistula. And the physician (named) Âkâsa-gotta lanced it. And the Blessed One when he was going round through the sleeping-places came to the place where that Bhikkhu dwelt.

2. Âkâsa-gotta, the physician, saw the Blessed One coming from afar, and when he saw him he said to the Blessed One ' Let the venerable Gotama come and look at this Bhikkhu's offence

¹ *Mohāvāgga*, VI 14 1 & 5

² *Ibid*, VI 22 3

³ *Ibid*, VI 22

it is like the mouth of an iguana!" And the Blessed One thinking, 'This foolish fellow is making fun of me,' kept silence and turned away. And in that connection, and on account of that, he called a meeting of the Bhikkhu-saṃgha, and asked the Bhikkhus 'Is there, O Bhikkhus, in that Vihāra a Bhikkhu who is sick?'

'There is, Lord.'

'What is the matter, O Bhikkhus, with that Bhikkhu?'

'That venerable one, Lord, has a fistula, and Ākāsa-gotta the physician, has been lancing it'

3. The Blessed Buddha rebuked (that Bhikkhu), saying, 'This is improper, O Bhikkhus, for that foolish one, unbecoming, indecent, unworthy of Samanas, not allowable and ought not to be done. How can this foolish fellow, O Bhikkhus, allow a surgical operation to be performed in that part of his body? The skin there, O Bhikkhus, is tender, the wound is difficult to treat, the knife is difficult to guide. This will not redound, O Bhikkhus, to the conversion of the unconverted'

And having rebuked him, the Blessed One, after delivering a religious discourse, said to the Bhikkhus 'You are not, O Bhikkhus, to allow a surgical operation to be performed upon you in that part of your bodies. Whosoever allows that, is guilty of thullakkāya offence.'

4. Now at that time Khabbaggiya Bhikkhus, since a surgical operation had been forbidden by the Blessed One, used a clyster.

They told this thing to the Blessed One,

‘Is it true, as they say, O Bhikkhus, that the Khabbaggiya Bhikkhus use a clyster ?’

‘It is true, my Lord’

He rebuked them, and having delivered a religious discourse, said to the Bhikkhus ‘No surgical operation is to be performed within a distance of two inches round the anus, and a clyster is not to be used. Whoever does so, is guilty of a *thullakkaya* offence’

And thus we find that Jivaka, the famous surgeon, is said to have cured a case of fistula-in-ano by the single application of an ointment¹ The operation fell into such disuse that when Śankaiāchāryya suffered from the same disease, no surgical aid was thought necessary by the physicians, though it is said that he was treated by renowned doctors of the time²

From Megasthenes, we learn that “among the Sarmans the Hylobion (living in woods) were held in most honour, and next to them the physicians, who are mendicants and also ascetics, like the class above them and the class below them,

¹ “And Jivaka Komirabhaḥḥa healed the fistula of the Magadha King Seniya Bimbisāra by one anointing ”

Mohāi Igga (Sacred Books of the East), VIII. 1 17

² अविकित्स्यमगन्तराश्वरोगप्रसरक्षीणितपद्मिन्स्वभार्या ।

अजुगुप्स्यविशीघनादिरपा परिचर्यामहताऽप्य तीटकार्यं ॥

* * * * *

निगदिते मुनिनेति भिषग्वरा विदधिरे बहुधाऽटमनश्चिन्ता ।

न च श्मशान गदीबहुतापदीविननस पटवी भिषन्तीऽभवत् ”

which consisted of sorcerers and fortune-tellers,"¹ and Strabo mentions that these physicians "cured diseases by diet rather than by medicinal remedies, which were chiefly unguents and cataplasms."²

6. No science can flourish without the support of the government of the day. The Hindus became a subject race, and any departure from the traditional store of knowledge in the shape of improvement in the quality and additions to its quantity was neither tolerated by the people, who are proverbially conservative, nor countenanced by the royal court, for the conquerors brought with them and patronised their own hakeems and doctors. Neither the Mahomedans nor the English have taken any real interest in the Indian Medical Science from preconceived notions that it contains nothing worthy of their perusal. The *Karmanas* again are so conservative in their opinions that they can not boldly advocate even the use of such drugs as are of unquestionable value in the treatment of diseases, as for example the use of Quinine in Malaria. To this may be contrasted the behaviour of Bhūvamīśra, who lived about three hundred years back and who adopted many medicaments of foreign origin. The consequence can easily be imagined, and in the language of Elphinstone, can be thus described "Physicians follow the practice of their instructor without inquiry, and surgery is so far neglected, that bleeding is left to the barber, bone-setting to the herdsman, and every one is ready to administer

¹ The Invasion of Alexander the Great. M'Cindley. Appendices p. 358.

² Geography, XV. 1. 58-60.

³ The Invasion of Alexander the Great. M'Cindley. Appendices p. 368-69.

a blister, which is done with the juice of the euphorbium and still oftner with the actual cautery' ¹

But we need not enlarge any further. The object of this essay is not to write out an exhaustive dissertation on the Hindu medical science but by a few suggestive facts, however imperfect and fragmentary, to stimulate curiosity and divert attention of the diligent scholars to a vast field of research, which seems as yet to have been only partially explored.

It is proper here to acknowledge that I have on all occasions freely availed myself of the labours of Dis Wise, Thakore Sahab of Gondal, and the translators of *Suśruta Samhitā* in the *Bibliotheca Indica*, namely, Dutt and Hoernle. It is a great pity that this translation has not as yet progressed beyond three fasciculi. Hoernle's recent contribution, "Osteology of the Hindus," is a move in the right direction and we hope it to be followed by similar enquiries in other branches of the science. Royle for the first time proved beyond doubt the high antiquity of Hindu medicine, and established its right position in the history of the science. Wise is the pioneer of systematic research in this field of study, and his sympathetic appreciation of the Hindu system of medicine will always be remembered with gratitude by our countrymen. Dutt's *Materia Medica of the Hindus* is a work of great merit, and I have derived material assistance from the excellent treatise, "History of Aryan Medical Science," by the Thakore Sahab of Gondal. Dr Ray's *History of Hindu Chemistry* is a valuable contribution in the cognate subject of chemistry. I have borrowed from these writers largely, but

¹ Elphinstone's *History of India*, 5th ed., p. 169.

I flatter myself it will also be found that I have further collected from various sources a store of valuable information, for which I am in no way indebted to any of my predecessors in the same field of research. The descriptions of the surgical instruments of the Greeks, the Romans and the Arabs, I have taken from the excellent English translations of Paulus Aegineta, the Extant Works of Aëtius and the Genuine Works of Hippocrates, prepared by the renowned Adams, for the Sydenham Society. I have also laid the recent monograph, "Surgical instruments in Greek and Roman times" by Dr Milne, largely under contribution, I only regret that I had no access to the book a little earlier, otherwise much of my labour in search for descriptions of the instruments of the Greeks would have been saved. For the last five years, I have been engaged on this investigation and it was when I had nearly finished, that Milne's book was mentioned to me by the Hon'ble Mr Justice Asutosh Mookerjee, the Vice-Chancellor of the Calcutta University and the President of the Asiatic Society of Bengal.

To complete the subject, I have added plates of nearly all the varieties of instruments, but they are more or less hypothetical as we do not possess any actual specimens of the instruments of the Hindus. Written descriptions of surgical instruments are uninteresting and often fail to convey the true idea, which could be easily made evident by the pencil. For purposes of comparison I have given drawings of instruments of the Greeks, the Romans and the Arabs, when I thought that they might be of value for the proper elucidation of my subject. I am indebted to many authors

I am indebted to many authors for some of the engravings of the instruments. I have been careful to give the source whence the borrowed ones are taken, as far as I have been able to ascertain them. If this has been omitted in any case, it is from inadvertence, not from design. My best thanks are due to them and I here acknowledge my indebtedness to the authors for availing myself of their labours without their permission. But many new illustrations will be found, and I have appended my name to those drawn by myself. These figures of the surgical instruments would be found to tally better with the descriptions of the instruments given in the Sanskrit books than the illustrations of the previous authors. The drawings of surgical instruments as given by me would look more like the figures in a modern catalogue of surgical instruments. Some of my friends could hardly believe when they saw the plates that these instruments were known to the ancient Hindus at such an early age. This feeling of amazement and incredulity as regards the surgical instruments used by the ancient Hindus has its parallel in the observations of Billroth¹ about the surgical instruments found in the excavations at Pompeii and now preserved in the museum at Naples. He says "It made a peculiar impression upon me, when I saw before me this two thousand years old surgical armamentarium of a Roman colleague, differing but slightly in the form of the more ordinary instruments from those of our time. *As longa vita brevis*." Milne also remarks "The works of those (Pacé, Scultetus and Heister) are profusely illustrated with instruments, some of which can plainly be seen to tally exactly with the descriptions of the classical authors."

¹ Billroth's Surgery, Vol. I. Introduction, p. 27. See also p. 11.

Quoted from the Sanskrit literature, p. 18.

In describing the surgical instruments, I have confined myself strictly to the texts of the authors and commentators whom I have quoted, and have given the original Sanskrit passages in the foot-notes. These will be of great help to scholars who will try to study the subject at first hand, and prosecute further historical inquiries. The references in the foot-notes do not refer to pages of my particular edition of the work, as such pagination causes inconvenience to the readers who may not secure the edition in question, so we have given the section, and chapter of the book which will be found in any edition.

In the translations of Sanskrit passages, I have endeavoured to follow the original as closely as possible, except where a somewhat free rendering was necessary to make the meaning clear.

The dates of the ancient Hindu authors of Sanskrit medical books cannot be ascertained with certainty. In the first chapter I have endeavoured to discuss briefly their approximate ages. But as I have compared the surgical instruments of the ancient Hindus with those of the Greeks, Romans and Arabs, a concise summary of the chronological dates of the Græco-Roman, Arab, and the later authors would be a great help in the proper elucidation of my text.

<i>Authors</i>	<i>Date</i>
Pythagoras	580-501 B C
Megasthenes	300 B C
Ktesias	400 B C
Hippocrates	160 B C
Hero of Alexandria	285-222 B C

<i>Authors</i>	<i>Date</i>
Dioscorides	First century A D
Celsus	25-30 B C to 45-50 A D
Scribonius Largus	45 A D
Soianus	First century A D
Rufus of Ephesus	98-117 A D
Galen	131-201 A D
Marcellus Empiricus	300 A D
Antyllus	3rd century, A D
Oribasius	326-403 A D
Theodore Priscianus	4th century A D
Caelius Aulicianus	4th or 5th century A D
Moschion	5th century A D
Aetius	5th century A D
Alexander of Tralles	525-605 A D
Paulus Ægineta	660 A D
Serapion	800 A D
Rhazes	850-932 A D
Halil Abbas	After 950 A D
Avicenna	980-1037 A D
Abul Cissim	~ 1106 A D
Avenzoar	~ 1162 A D
Ruċ	1509-90 A D
Scultetus	1650 A D
Heister	1739 A D

I can not suffer this work to go forth without offering at least an explanation of if not an apology for the delay which has occurred in the publication of this thesis. It is mainly due to the accidental fire which reduced the types and plates to

for this work to ashes and destroyed a part of the manuscript. This portion had to be written again. Again the task of reading proof sheets was laid on me entirely. The occupation of a laborious profession encroached on my time, and I was not fortunate enough to secure the co-operation of any worker in this field of research. The result might be anticipated and no one is more conscious of the unsatisfactory issue than myself. I had no experience in proof reading, and so mistakes are not uncommon. Some of the errors will be found corrected in the corrigenda. As regards the corrections of many of the proof sheets of the Sanskrit foot-notes I was assisted by my son Huendranāth Mukhopādhyāya, who helped me much in getting this book completed. The author will feel obliged if informed of any errors that may be detected and of references to informations which ought to have been given, and also for any hints that may make a future edition more useful to the readers. But I have this consolation in my mind that I have not pushed this work through the press hurriedly or prefunctionally and I have done my best. I have laboured with the usual drawbacks of an active professional life and if this be admitted by the critic as an excuse for errors and failures, I shall be grateful to him.

A copious index has been provided for this work, whereby anything material in the whole book may be readily found out, of which it may be said that it wants no other advantages than such as the author had not power to give.

It would not be out of place here to mention that part of this essay was read before the Asiatic Society of Bengal in June, July and August, 1908. The learned President in his annual address remarked as follows: "In the course of the last

session Dr Guindianath Mukerjee submitted to the society a paper of considerable extent, in which he elaborately* examined the subject of the surgical instruments of the ancient Hindus. The questions he has raised, as to the priority of Hindu medicine over that of the Greeks, the Romans and the Arabs, are likely to arouse controversy, but in whatever way the question of priority may be decided, it seems to me truly remarkable that the descriptions given in our most ancient books on medicine, of the surgical Instruments then in use, should bear a close resemblance to the descriptions given not only in Greek, Roman and Arab medical writings but in many cases with the descriptions given in modern works on surgery. I trust that this subject, so peculiarly Indian, will not be left alone and will receive the attention from investigators which it undoubtedly deserves "1

As regards the transliteration of Sanskrit words, we have employed the method adopted in the Congress of Orientalists and enunciated in the Journal of the Royal Asiatic Society, ignoring in fact, the unpleasant characters of the Sacred Book of the East

¹ Journal and Proceedings of the Asiatic Society of Bengal, Vol V, 1909, Annual Address, p XXX

I

SANSKRIT AND ALLIED ALPHABETS

अ	" ओ	० ट	l व	b
आ	ā ओ .	00 ट	lh भ	bh
इ	i क	k उ	d स	m
ई	ī ख .	kh ढ	dh य	y
उ	u ग	g ण	a र	r
ऊ	ū घ	gh त	l ल	l
ऋ	r ङ	a थ	lh व	v
ॠ	ī च	c द	d श	s
ऌ	l छ	ch ध	dh ष	s
ॡ	l ज	l न	u स	s
ए .	e झ	ph ष	p ञ	h
ऐ	ai ज	ñ फ	ph ङ	l

• (Anusvara) m | s (Avagraha) •

˘ (Anunāsika) m Udātta ∠

: (Visarga) h | Svarita △

× (Jihvāmūliya) h | Anudātta, 2

× (Upadhmanīya) h |

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and commentaries. *Viṅbhūta* I.—*Astānga* *Samgraha*, his age, edition and commentary. *Viṅbhūta* II—*Astānga* *Hṛdaya* *Saṁhitā*, editions and commentaries. *Viṅbhūta* III—*Rasa* *Ratna* *Samuccaya*—*Mūlhyakara*—*Nidāna* *Arṇa*—*Mūlhyakara*—*Siddhivogya*—*Cikrapāṇḍita*—*Calitsāstra*—*Samgraha*, editions, *Śrīṅgadhara*—*Śrīṅgadhara* *Samgraha*, editions and commentaries, *Bhāva* *Misra*—*Bhāva* *Prakāśa*, editions.

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Whetstone Instrument cases Boxes for ointments, ointment pots, and portable cases
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100—224

- 1 The Svastika yantra or cruciform Instruments—
 Simhamukha svastika or Lion-faced forceps
 Vyāghramukha or Tiger forceps Vikamukha
 or Wolf forceps Taksamukha or Hyena
 forceps Rksamukha or Bear forceps
 Dvapamukha or Panther forceps Mūjāri-
 mukha or Cat forceps Śigāmukha or Jackal
 forceps Anbbhūka or Deer forceps Kākā-
 mukha or Crow forceps Kankamukha or
 Heron forceps Kururamukha or Osprey for-
 ceps Cāsamukha or Blue-Tay forceps Bhī-
 samukha or Eagle forceps Sasighātramukha
 or Hawk forceps Uḥkamukha or owl forceps
 . Cillamukha or Kite forceps Śyānamukha or
 Vulture forceps Gullamukha or Gull forceps

Kṛmāṇi mukha or Curlew forceps Bhṛṅguśāpi-
mukha or Butcher-bird forceps Aṅgulikṛmā
forceps Avibhañjan mukha forceps Nandi-
mukha forceps II The Sandamsa or Pincher-
like forceps Forceps with and without
handles Forceps with Smooth and rough ends
Epilation forceps Mucuti or Mucundi
Vamsabudala or Bamboo forceps III Tāla-
Yantra or Picklock-like instrument Ectāli
and Dvītāli The Eu-scoop IV The Nāḍi-
Yantra or Tubular instruments Kēṭhasādhā-
valokinī or Throat speculum Pāṇcamuka and
Trimukha Tubular instruments for inspec-
tion of urows Śilyanughātānī The Impel-
lent Tubular instruments for Piles—for inspec-
tion and medication Śunī The Rectal Specu-
lum Caloptei Tubular instruments for the
Fistula-in-ano Tubular instruments for the
nose Nasal Speculum Nathu-karanī and
Yamaka-nathu-karanī Nasal tubes The
Anguli-trāṇaka or Finger-guard Yoni-
Viareksana or Vaginal Speculum Dioptei
Bivalve Speculum The tubular instruments for
wounds—Viana-vasti or Wound-Syringe
Tubular instrument for ascites Dākodara yantra
or Canula Tubular instruments for Hydrocele
Tubular instruments for rectal stricture
Tubular instruments for injection into the
rectum—Vasti Yantra or Rectal clyster
Uttaravasti or urethral, vaginal and uterine
tubes Catheters Tubular instruments for
inhalation and fumigation Disinfection
of rooms, clothes &c. Tubular instru-
ments for cupping Śruṅga or horn Alābū
Yantra or gourd Ghati Yantra V Śalākā

PAGES

or rods Earthworm probes Arrow probe	„
Snake's hood probe Fish-hook probes The	
Śankus, Śwab probe Spathomele or spatula	
probe Spoon-shaped probes Cyathiscomele	
Nail-shaped probes Jāmvavaustha probe	
Gamma-shaped probe and the ankuśa cautery	
Collyrium probes Kairā Śodhana or En-	
cleanei Gaibha-Śanku or Fetus or Traction	
hook Yujā-Śanku or Midwife's forceps	
Sarpa-fana or snake's hood-like rods Stone	
extractor Hippocratic oath Saripunkha-	
mukha Probe Aiddhacandiamukha or Half-	
moon Probe Bone Lever Director Urethral	
Probe VI The Upayantia or Accessory	
Instruments Rajju or thread, Venikā or	
twine, Patta or Bandages, Abdominal binder,	
Field Hospital, Dressings Carma or leather	
leather bandage, leather ligatures Yantia-	
Śatika or Inthotomy Strap or binding ap-	
paratus, Pāsa Leather bags Śirovasti or	
leather-bag for the head Leather Band	
Leather Bottles, Jua, etc Antuvalkali or	
Barks The crutches, Tendrils of creepers or	
Litī Vastri or cloth Asthilīśma or stone	
Mudgari or Hammer Pārapadatali or hand	
and foot Anguli or fingers Jihvī or tongue	
Danta or tooth Nikha or nails Mukha or	
mouth Vālī or hair Probing Sutura	
material Aśvakaṭika or the ring of a horse's	
bridle Śākhī or branch of a tree Sthāna	
or spittle Prayithna or fluxing the patient	
Harī or Happiness Aviskānta or Load-stone	
Kṣāra or Caustics or Potential cautery Agni	
or Actual cautery Bhesajā or medicines	
Gent's gut Arrest of hæmorrhage	

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225—281

The Mandalāgrī or round-headed knife—Krapitra or saw—Viddhapitra—dīghavaktra and hrasyavaktra—the long and short-mouthed knives—Hypodermic medication—Nakhasītra or Nail-parei—Mudrikā, angulīśītra or finger or ring-knife—Utpalipitra, Phlebotome—Aiddhadhara, Cakradhūra—udhyardhādihāra—Suci or needles—curved, half-curved and straight—Yavamukhī needle—Kuśipitra—Ātīmukha—Śaruīmukha or scissors—Antarmukha—aiddhac—midhānana or half-moon-faced scissors—Aidhucandri knife—Trikūccaka, kūcca, khapa—Kuthārika—Vilīmukhī or trocar—Ātā orawl, kanna-vedhanī or ear-perforator—Jutlukā, Pāmantha—Karmāra or nālī—Vetasputraka—Vadisa or sharp hook, Danti-Śanku or tooth-scaler—Danti-lekhana or tooth-scaler—Enīpada—Esaṇī or sharp probes, needle-shaped probes, Kuruvakī probes—The operation of couching of cataract—Yavamukhī—Śalā—Sarpāsyā—Gold or silver knife—Pratuda—The mode of holding the sharp instruments—The practical training in surgical operations

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CORRIGENDA.

P	C	o	E	N	I		
	vi	Para 5					
	vi						
	xiii				1	of Mohāṅga	of Mohāṅga
	82	line 4			1		
	116	, 21			5		
	182	10-15			2		
	x	10					
	202	1 of para 5					
	203	2 of last line					
	262	12				diap no 18	digonos
	308				1		
	317	10					
	319				1		
	320	, 5			1		
	xiii				2	Vijaya	Vijaya
	xx					Bibliotheca	Bibliotheca
	3				1 & 2		
	303				1	Macdonell	Macdonnell
	4				1	Dārīla	Dārīla
	17	7				Bhānumati	Vānumati
	27	item 5				Rabi	Rabi
	30				1	Archo	Archo
	12				3		
	31					Śāṅgadhara	Śāṅgadhara
	35	11					
	40	8					
	37	, 11					
	39	, 23					
	40	, 14				Water and	Water
						Mortar	Mortar
	70				3		
	71				1 & 3	Viddha	Viddha
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	88	13				Kapāta	Kapāta
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	109	, 8				Śilya	Śilya
	117	, 5				bamboo	bamboo
	119	, 19				Barnes	Barnes
	120	, 21				Sorts	Sorts

Page 159	line 18		read Jāmvotauṣṭha for Jamvotouṣṭha
" 178	item 10		" Oina " China.
" 181		" 2	" Obstetric " Obstetric
" 196	line 12		" Gayadāśa " Gayadāśa
" 219	" 14		" Sesamum " Sesum
" 219	" 21		" effectual " effectual
" 221	item 3		" Pācana " Pāchana
" 242	line 2		" Parietes " Parietes
" 262	" 10		" Round four " four cornered
			cornered round
" 285	" 15		" Hippo " Hyppo
" 295	" 3		" Requisites " Requisites
" 306	" 11		" Yaṣṭhi " Yaṣṭhi
" 311	item 2		" octagonal " octagonal
" 328	" 8		" hātā " hata
" 331	line 18		" Jolly " Jolley
" 340	" 5		" Physician " Physician
" 346	" 18		" amber " ambr
" 348	" 2		" Pantāmaha " Pantāmoha
" 352	" 22		" Furoz " Furoz
" 354	" 11		" Areca " Arecha
" 355	" 12		" Drūṣita " Darusita

WORKS BY THE AUTHOR.

1 Muscles of the Human Body, arranged in Tabular forms
Fourth Edition Re 1

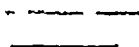
2 Tropical Abscess of the Liver

Thesis approved for the degree of Doctorate in Medicine,
Madras University Rs 5

3 Glossary of Indigenous Medicinal Plants
(In the Press)

1 Notices, Biographical and Bibliographical, of the Indian
Physicians and their Works on Medicine
(In the Press)

5 Medicine in the Vedic times
(In preparation)



THE STAR MEDICAL HALL, ‘
80, Russa Road North, Bhawanipur,
CALCUTTA.

THE Surgical Instruments of the Hindus.

CHAPTER I

INTRODUCTION.

ANCIENT MEDICAL AUTHORS AND THEIR WORKS

The Science and Art of Medicine, like many other different branches of learning originated with the Hindus. They consider the art of healing as an Upaveda and it is generally known as Āyurveda, that is the art of prolonging life. Like the Vedas they trace the origin of the science to God, the fountain of all true knowledge. Bramhā transmitted this heaven-born science to this world for benefit of the mortals. In one of the sacred writings, the Āyurveda

It was composed as a sub-division of the Atharva Veda and consisted originally of a *lākh* slokas or a hundred thousand stanzas divided into a thousand chapters. Then considering the short span of life and inadequate intelligence of man, he divided the book into eight parts¹ as follows —

¹ तद्यथा ॥ अष्टौ शाखाश्च कायचिकित्सा भूतविद्या औषधकारणसम्यक्करण
रसायनतन्त्रा वाजोपकरणमिति ॥

(५१५५) I

कायचिकित्सा शास्त्रात् अष्टादशैक विद्यारम्भैश्चिकित्साम्भुतविद्या औषधकारणसम्यक्करण
रसायनतन्त्रा वाजोपकरणमिति ।

(५१५५) I

तेदोऽष्टौ शाखाः कायचिकित्सा भूतविद्या औषधकारणसम्यक्करण रसायनतन्त्रा वाजोपकरणमिति ।

- 1 Sālya Tantra or Major Surgery
- 2 Śālākya Tantra or Surgery of parts above the Clavicles
- 3 Kāya Cikitsā or Inner Medicine
- 4 Bhūtavidyā or Demnology
- 5 Kaumārābhṛtya or the Science of Paediatrics
- 6 Agada or Toxicology
- 7 Rasāyana or Treatment to prolong life
- 8 Vājikanana or Treatment to stimulate the sexual power

The book is no more available now, Susruta being the authority for the above information ¹

A different view is held by others, who trace the origin of Hindu Medicine in the verses of the Rgveda -

१ इह खल्लागुर्वेदी नाम यदुपाग्रमथर्जवेदसंगानत्यादेव प्रजा श्रीकण्ठसहस्र-
मध्यायसहस्रञ्च कृतवान् स्वयम् । ततोऽन्यायुष्टमस्यमेधन्वासावलीवा नराणा भूयोऽटथा
प्रणीतवान् ॥

Susruta Samhitā, I 1

तत्र चेत् प्रहारं सुर चतुर्णाम्कसामयजुरथर्जवेदानां क वेदमुपदिशन्त्यायुर्वेदविद ।
किमायु कस्मादायुर्वेदः किञ्चायमायुर्वेदः शाश्वतोऽशाश्वत इति । कानि चासाराङ्गानि
कशायमवेतस्य किमर्थञ्चेति ॥

तत्र भिषजा पृष्ठेनेव चतुर्णाम्कसामयजुरथर्जवेदानाम् आत्मनोऽथर्ववेदे भक्तिरादिश्या ।

Caraka Samhitā, I १११

The origin of medical science, as quoted in the above passage of Caraka, does not however agree with the view expressed by the author in the Sūtra Sthāna, Ch I (See footnote 1 P 4) In Ch XXX, we find that an attempt had been made to make a compromise between the two views of Agniवेश and Susruta. Evidently this was the work of a later redactor, possibly Drdhavala

न ह्यायुर्वेदसंग्रामूलोत्तिरुपलभ्यते । अन्यत्राववीधीपदेग्राह्यमेतदेव ह्यमधिकृत्य उत्पत्ति-
मुपदिशन्त्येके स्वाभाविकज्ञासुर लक्षणमधिकृत्य यदुक्तम् इह चाद्येवाध्यायि * * * * ॥

Caraka Samhitā, I १११

२ ऋग्वेदसंग्रामूलोत्तरे उपवेद ।

Caraka Vyākhyā by Vyāsa.

ATHARVA VEDA

"On examining the contents of the Atharva Veda more in detail, we find that the hostile charms it contains are directed largely against various diseases or the demons which are supposed to cause them. There are spells to cure fever (tikmān), leprosy, jaundice, dropsy, scrofula, cough, ophthalmia, baldness, lack of vital power, fractures and wounds, the bite of snakes or injurious insects, and poison in general, mania and other ailments. These charms are accompanied by the employment of appropriate herbs. Hence the Atharva Veda is the oldest literary monument of Indian Medicine"¹. This Veda can not belong to a period later than 1000 B.C., but possibly earlier. It exists in the recensions of two different schools. That of the Pūppalādi is only known in manuscript, discovered by Prof. Bühler in Kashmir and described by Prof. Roth in his tract *Der Atharva Veda in Kaschmir* (1875). The printed text edited by Roth and Whitney in Berlin 1856 gives the recension of the Śaunika School². It has been translated into English Prose by Whitney, 2 Vols. into English verse by Griffith, 2 Vols., Benares 1897, and with the omission of the unimportant

¹ Madomkul, Sanskrit Literature, p. 170.

अथर्ववेदस्य ७००० चतुर्दश वेदवेदेषु प्रादुरागमिषात्तर्कसाध्यं विद्वान्मनु-
योगदानिर्देशः । तेषां सन्वेदेनेव हीनं दुर्लभं यत्तु वेदनामयं सारं वेदना-
यदेव सद्ये विद्याय गुरुतेन वदन्त्वमिति युते सद्येनामयं यद्वेदः ।

Kullukabhattas comment. Atharva Veda, p. 170.

² On the date of Atharva Veda, see *Journal of the Asiatic Society of Bengal*, 1856, p. 1. *History of Weds*, by Prof. Roth, Berlin 1856, p. 2. 1856-29.

hymns, by Bloomfield¹ into English Prose, with notes, in Vol XLIII of the Sacred Books of the East

CARAKA SAMHITĀ

In the Caraka Samhitā we find that Brāhmā taught Dakṣa the science of medicine. Dakṣa became the preceptor of the Aśvin twins; they in their turn became the teachers of Indra and Indra imparted this knowledge to Bharadvāja who was sent by a conclave of sages to learn the art for the welfare of the human race. Bharadvāja had Puroṣuṣa, Ātreya and the others as disciples. Ātreya's students were Agniveśi, Bhela, Jatukuntī, Parāsu, Hārīta and Kṣātrapāṇi, all of whom became celebrated as the authors of treatises on Medicine, the Caraka Samhitā being a revised and improved edition of the treatise of Agniveśi, which was declared to be the best production. Caraka did not, however, redact the whole

¹ He has also edited the Kauṣika Sūtra of the Atharva Veda, with extracts from the commentaries of Dīpta and Keśava (see Vol XIV Journ. Am. Orient. Soc.). It is very useful as a help to the proper understanding of the meaning of a hymn.

- दीर्घक्रीवितमखिच्छन् भरद्वाज उपगमत् ।
इन्द्रमुद्यतपाशुजां शरणममरेश्वरम् ॥
ब्रह्मणा हि यथा प्रोक्तमायुर्वेदं प्रजापति ।
जयाह निखिलेनादावश्विनो तु पुनस्ततः ॥
अश्विन्या भगवान् शक्रः प्रतिपेदे ह केवलम् ।
ऋषिप्रोक्तो भरद्वाजस्तस्माच्छक्रमुपागमत् ॥

Caraka Samhitā, I 1

- ३ अथ सैन्धीपरं पुण्यमायुर्वेदं पुनर्ध्वंसम् ।
शिष्येभ्यो दत्तवान् पण्डित्य सर्वभूतानुकम्पया ॥
अग्निवेशश्च भेलश्च जतुकर्णश्च पराशरः ।
हारीतश्चारपाणिश्च जगद्भुक्तमुनेर्वचः ॥
बुद्धेर्विशेषस्तचासीन्धीपदेशान्तरमुने ।
तत्त्वस्य कर्त्ता प्रथममग्निवेशी यतोऽभवत् ॥
अथ भेलादयश्चक्रुः स्वस्वतन्त्रकृतानि च ।
आवयामासुर्गानि सर्पिसदृशसुमेधसः ॥

Ibid, I 1.

book,—the last forty-four chapters¹ were edited by Dṛdha-
vala,² a native of Panchanadapura, long supposed to refer
to Punjab (the land of five rivers) but at present identi-
fied with a town in Kashmīr by Dr. Hoernle.³ Two other
works, the treatises of Bhela and Hārīta, are still extant—the
former existing in manuscript in the Tanjore Library⁴ and the
latter as printed texts by *Kavirājes* K. C. Sen and B. L. Sen,
of Calcutta.⁵

Now as regards the age of Cāka, there is great diver-
gence of opinions. The Indians generally believe him to be a
Rṣi of great antiquity while the European scholars try

¹ For a discussion on the part added by Dṛdhaṅgala, see Hoernle's *Studies in Ancient Indian Medicine*, J. R. A. S. 1908, p. 997-1002. Also see pp. 11-15 in the *Vanavāsadhī Darpana*, Vol. I, by Kaviyājña Bṛijī Chariṇ Gupṭa, 1918.

² अतस्तन्नीतममिदं चरकेणातिवृद्धिना ।

संस्कृतं तन् तु संसृष्टं विभागेनीपान्च्यते ॥

इदमन्यूनशब्दार्थं तन्त दीपविवर्जितं ।

अखण्डार्थं दृढवली जातं पञ्चनदे पुरे ॥

कृत्वा बहुभ्यस्तन्त्रेभ्यो विभेपाच्च वलीकृतम् ।

सप्तदशोपधा आद्यसिद्धिकल्पैरपूरयत् ॥

Cāka Smṛiti, VIII. 171

अग्निं सप्तदश आया कर्पा मिदं पञ्च च ।

नामाद्यन्तेऽग्निवेशस्य तन्त्रे चरकसंस्कृते ॥

तन्त्रेस्तान् कापिनवलं शेषान् दृढवलीऽङ्करीत ।

तन्त्रस्यास्य सप्तार्धस्य पूरणार्थं यथातथम् ॥

Id. VI. 335

³ Hoernle's *Studies in the Medicine of Ancient India*, p. 100. Introduction, p. 2. See also his article on 'Dardha' in *Journal of the Royal Asiatic Society*, in the *Archæological Collection*, Vol. 1, 1907.

⁴ See Barwell's *Patana Catalogue*, No. 10773, 10800, 10801, 10802.

⁵ It is doubted whether the *Parasambhāṣa* is the work of Hārīta, Hārīta. The printed text is by K. C. Sen and B. L. Sen, who were doubtless pupils of Hārīta. See *Journal of the Royal Asiatic Society*, 1908, p. 100.

to connect him with historical events of more modern times Sylvan Levi has recently discovered in the Chinese Translation of the Buddhist *Tripitaka* that Caraka was the Court Physician of the Indo Scythian King Kaniska, in the first century A D.¹ But the following objections are to be met with before his conclusions can be accepted as proved —

1 The age of Kaniska is not yet settled, the probable limits of his reign being from the first century B C to the second century A D. Moreover in the Buddhist *Tripitaka* referred to, the name of Caraka is simply mentioned as the Court Physician of the King Kaniska but there is nothing to identify him with the author of the book. The same name, found in different places, does by no means signify the same person.

2 The time assigned to Caraka by the Indian medical tradition is of great antiquity. With regard to the chronological position of the three old authors, he is mentioned as anterior to Suśruta and Vāgbhata I.²

3 Dr Rāy has pointed out that the name Caraka is patronymic in the Veda.³ It is quite possible that a much

¹ See Journal Asiatique—July to December 1896, p 141 to 181 and January to June 1897, p 5 to 42, also Indian Antiquary Vol XXXII, 1903, p 382 and Vienna Oriental Journal, Vol XI, p 161

² See V A Smith's Early History of India, P. 225-26

Dr Fleet in J R A S, 1906, P 979

Dr Bhandarkar in J R A S (Bombay Branch), Vol XX, P 269

J A S B Vol XXXIX, 1870, p 65 and 126

³ चरकः सुश्रुतश्चैव वाग्भटश्च तथापरः ।

सुख्याश्च स हिता वाच्यास्त्रिष्व एव युगे युगे ॥

अत्रि कृतयुगे वैद्यो वापरे सुश्रुतो मतः ।

कलौ वाग्भटनामा च गरिमात्रं प्रदृश्यते ।

Hārta Samhitā, Parīśiṣṭādhya

⁴ Dr P C Rāy's History of Hindu Chemistry, Introduction P X

later namesake of his, is referred to by the *Tripitaka* just as we know that more than one Vāgbhata appeared as successful physician. Again we have evidence that eminent physicians in later times were called Caraka by way of a compliment and so Vāgbhata was called Caraka of Sindh or Sindhiya.

4 Pāṇini wrote special Sūtras for the Agniveśis and the Carakas ¹ These names must have been famous before Pāṇini's time, otherwise he would not have written special Sūtras for them Prof Goldstuecker has conclusively proved that Pāṇini could not have flourished later than the sixth century B.C. ²

5 Patañjali wrote a commentary on Carakī. He flourished during the second century B. C. Both Cūṣpūṇḍrī datta and Bhoja allude to him as the redactor of Cūṣpūṇḍrī Samhitā. So Carakī must have flourished long before him, for unless his work was regarded as a standard work of authority, Patañjali would not have taken so much pains to write notes on the book, and still more for issuing a redaction.

6 The internal evidence of the book itself speaks against such an assumption. There is no salutation to any deity at the

¹ कटघरकाष्ठिक । Pāṇini 4.3.107

गर्गादिभ्यो यच् ॥ Ibid 1 1 105

गर्ग। वतंस। * * * * अग्निवेश * * * * पद्मकर। चतुर्वर्ग। * * *

* Coldstream's *Pinnal*, and *Journal of the Arts*, vol. I, p. 1.
Vol. XLII, P. 254.

यः सु इति चरके प्रतट्टलि ।

Quadrant 1: High Performance, High Cost

१. पातङ्ग-महामा-चक्र-विन्यासः ।

[illegible]

beginning of the book,—a custom invariably found to be observed in the more modern compilations. There is complete absence of Paurāṇic theology in the *Caraka Samhitā*, nor is there any reference to Śākya Muni and his religion. Kaṇvika was a great patron of Buddhism, and it might naturally be expected from the Court Physician of the king to describe the charitable hospitals which we know from the edict of Aśoka, to have flourished in every quarter of India. On the contrary we find descriptions of a hospital as reserved for rich men only at their own houses. Those gods and goddesses that figure so prominently in the Pūrāṇas were unknown during his time.¹ Beef was not then, apparently, a

¹ No doubt the names of Lakṣmī, Kṛṣṇa and Vāsudeva occur in *Cikitsita Sthānam*, Chapter XXV, but it should be remembered that they occur in the Supplement added by Dīdihavala in later times.

सर्व्वग्रहा न तत्र प्रभवन्ति न चाग्निश्चतुष्पचीरा ।
 लक्ष्मीय तत्र भजते यत्र महागन्धर्वास्त्यग्नि ॥
 पिब्यमाण इमंघ्रात सिद्धं मन्त्रमृदीरयेत् ।
 मम माता जया नाम विजयी नाम मे पिता ॥
 सोऽहं जयी जयापुत्री विजयीऽथ जयामि च ।
 नमः पुरुषसिंहाय विष्णवे विश्वकर्म्मणे ॥
 सनातनाय कृष्णाय भवाय विभवाय च ।
 तेजो वपाकपे साक्षात् तेजो ब्रह्मेन्द्रयीत्यमे ॥
 यथाह नाभिजानामि वासुदेवपराजयम् ।

Caraka Samhitā, VI, १११

But Kṛṣṇa and Vāsudeva are mentioned in Pāṇini as demigods, having many adherents who formed a class “वासुदेवार्जुनाद्या वुन” Pāṇini, 4 3 98. Again the passage may be an interpolation of a subsequent *Paṇinā Vaid*.

So Brhasadvāja is also mentioned in Dīdihavala's Supplement, as a god to be worshipped during the preparation of some medicines.

ब्रह्मघोषग्रहपट्टहमेरीनिनादै सिद्धं सितं च वृद्धतच्छायं गजकन्धस्वमीरीपयेद्गवन्तं
 वषट्कजसभिपूज्य त स्नेहं विभागमाचिकमङ्गलाशी स्तुतिं देवतार्चनैर्वस्ति गमयेत् ॥

forbidden food, for it is spoken of as an article of diet that should not be indulged daily,¹ nor should it be used in excessive quantity as it is mentioned as a cause of the disease, Vāta-Rakta.²

The style of the book is antiquated and decidedly savours that of the Brāhmanas. Nāya and Vāśeśika systems occur in the text,³ and so probably the book was written long before the compilation of these Sūtras.

Editions—The book had undergone several editions. It was edited by Jībānanda Vidyāsāgar, Calcutta, in 1877 and 1896 (2nd Ed.) by Gangādhara Karmatna, Benhampur, 1879, by Gupta, Calcutta, 1897, with commentary by Cakrapāṇadatta, Calcutta, 1892-93 by Jaśodānandana Suktū, with Bengali translation, 1894.

Translations—It had been translated into English by A. C. Karmatna, Calcutta, 1897. Cuaka was translated from Sanskrit

And we find that the antidote to poison called मरारुद्रको is said to have been told by Trivambika (Śiva) to Rucyama (Kuvera).

अमरुद्रोऽयं वेद्यपात्रात्तन्मृगवर्षेण पट्टिम् ।

Chula Sūhita VI. 333

Also we find the name of Kārttika mentioned in Sec. IV. ch. 100.

• प्रसव तमसिष्ठमसिष्ठिष्टा मभान्ते

कार्तिकेयगुति पच कार्तिकेयमिष्टिष्टमिति ।

² कृषिंवायुः किल्लटास ईश्वर मन्त्रमिति ।

मन्त्रान्दृष्टि च साधनं यावदायुः न ईश्वर ।

1. 333

• ³ कृष्णान्दृष्टिमात्रादृष्टिष्टमिति ।

दृष्टिष्टमिति । मन्त्रमिति ।

2. 333

into Arabic in the beginning of the eighth century and his name "Sharaka Induanus" occurs in the Latin translations of Avicenna, Rhazes and Serapion. "A translation of the Karaka¹ from Sanskrit into Persian and from Persian into Arabic is mentioned in the Fihrist, (Finished 987 A D) It is likewise mentioned by Albūcūnī², the translation is said to have been made for the Barmekides"³ Albūcūnī's chief source on Medicine was "Caraka, in the Arabic Edition of Abū Ibn Zayn, from Trabaristan"⁴

Commentaries —

- 1 Patañjali—2nd century B C—not available
- 2 Cakrapāṇidatta's Caraka Tātparyā Tikā, or Āyurveda-dīpikā⁵—1060 A D
- 3 Haricandra⁶—1111 A D—not available
- 4 Śībadāsa's Caraka-Tattva-Pradīpikā
- 5 Gaṅgādhar's Jalpa-Kalpa-Taru—1879 A D

¹ Proceedings of the As Soc, Bengal, 1870, September

² Reinaud, *Memoire sur l'Inde*, P 316

³ Maxmuller's Science of Language, Vol I., P 168, Foot Note.

⁴ Sachau's preface to India, P XL

⁵ See Caraka Samhitā with Cakrapāṇidatta's Commentary by *Kaṭurāja* Harinīth Viśīrāda, Calcutta, 1895

⁶ A Commentary written by Haricandra is referred to⁶ in the Sanskrit Slokas narrating the geneology of Maheśvara, the author of Viṣṇuprakāśa and Sāhasāṅkacarita, who flourished during the reign of Śīhasāṅka, king of Gazipur in 1033 Saka (1111 A D Wilson)

श्रीसाहसार्द्रपतेरणवदविद्य-

वैद्यीत्तरङ्ग पदपङ्क्तिमेव विभक्तु ।

यस्यन्द्रघातचरितो हरिचन्द्रनामा

सङ्ग्राह्यया चरकतन्त्रमलचकार ॥

The next treatise on Hindu Medicine is the *Suśrūta Samhitā*. *Suśrūta* was the son of the sage *Viśvāmitra*¹ a contemporary of *Rāma*. He learned the Science of Medicine from *Dīvodāsa*, surnamed *Dhanvantari*, king of *Benares*, at his Himalayan retreat. According to *Suśrūta*, *Dīvodāsa* was the incarnation of *Dhanvantari*, the celebrated physician of the gods in heaven, and he first propounded the Art of Healing in this world². *Suśrūta* represented the Surgical School while *Cāraka* was pre-eminently a Physician in practice.

As regards the authorship of the book, opinions differ. To Susruta, Dhanvantari addressed his lectures on Major Surgery,³

¹ Mahābhārata, Anuśāsana Parva, Ch. 139, Vs. 8-11.

विश्वामितात्मजस्यपि गिष्य सुश्रुतमप्यज्ञात ॥

Saints Sep 14, 18

विद्वज्जायन्ताय नमः । गुह्यसागधसिद्धौदधि ।

दिश्वामि वसुत श्रीमान् मयुत परिपृच्छति ।

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- मन्त्राभ्यां च तत्त्वज्ञानं व्यप्यते इति वदामहे ।

विद्यानिधिः शशाङ्कः निम्नः क्षात्रियः

17 1 171 171

[illegible][illegible]

which he reproduced in this work. But in the opening lines of the book, salutation is offered to Brāhmā, Dakṣa, Aśvins, Indra, Dharmantari, Suśruta and others¹. This shows that Suśruta can not be the author of the work or at least of the work in its present shape, for no author can offer salutation to himself. By "the others" are no doubt meant the notable surgeons who practised and taught the Science of Surgery and who were either contemporary with or posterior to Suśruta. Possibly the original Suśruta Saṁhitā had been recast and the redactor could appropriately offer a salutation to the original author and to other surgeons who flourished before him. There is also an Indian medical tradition, noted in Daṭṭa's Commentary, which assigns the improved and supplemented edition of Suśruta's original work to Nāgārjūṇa, the celebrated Buddhist Chemist, who is said to have been a contemporary of the king Śātvāhana².

In the third chapter, Suśruta enumerates the subjects described by him,—the chapter forming an index of the book. Therein he mentions the five principal divisions of his book and says that the Uttara Tantra or the Supplement would be

¹ नमो ब्रह्मप्रजापत्यश्रिवयलभिर्दन्तरिसुश्रुतप्रसूतिभ्यः ।

Suśruta's Saṁhitā, I

² यत्र यत्र परीक्षे निधीगस्तत्र तत्रैव प्रतिसंस्कर्तुं सूत्रं ज्ञातव्यमिति । प्रतिसंस्कर्त्तव्यं पीडनागार्जुन एव ।

Daṭṭa's Commentary to Suśruta, I 1

See also Dr. Cordier's *Recentes Decouvertes*, pp. 12-13

³ See *Harsacarita* by Vīṇa.

Beal's *Buddhist Records of the Western World*, Vol. II, P. 200, 212, 216

Burgess' *Archaeological Survey of S. India*

Introd. à l'histoire du Budh. Ind., P. 508

described afterwards¹. Now the fact that the sixth part was appended to the work as a Supplement or Uttara Tantra (or, after treatise) clearly shows that it was written afterwards by another surgeon and added to the original treatise. If the original Sūśruta wished to have six divisions of his book, he would have mentioned it clearly in the index and would not have, after stating that his book consisted of five parts, added that "the Supplement would be described afterwards," - which seems to be an interpolation of the Supplementor to pass his edition as the original work of the author. Again at the end of the fifth section, there is a passage describing the importance of the Āyurveda, which was meant as the conclusion of the book by the author². It is to be noted

¹ प्राणाभिरित सविशमध्यायगत पञ्चसु स्थानेषु । तत्र मृतस्थानमध्याया षट्पञ्चाभिहितम् ।
 षोडश निदानानि । दश शरीराणि । चत्वारिंशच्चिकित्सितानि । अष्टा कर्मा । तदुभय
 षट्पञ्चि ।

अध्यायानां गत विनयेवमेतदुदीरितम् ।

अत पर स्वनाम्नैः तन्मसुधसुधये ॥

Sūśruta's student, I m

² षोडश चिकित्सितमेतत् समामेन प्रकीर्तितम् ।

सविशमध्यायगतमस्य व्याख्या भविष्यति ॥

तत्र सविशमध्यायगत पञ्चसु स्थानेषु । तत्र मृतस्थाननिदानशरीराभिरित्स्मितम् ।
 अर्धवशात् सविशमध्यायगतं तन्मे शेषानप्यान् व्याख्यास्यामः ।

II 1, 1 1

• ¹ सविशमध्यायगतमेतदुक्तं विभागम् ।

इदीदिष्टाननिदिष्टान्मध्यान् षट्पञ्चाभिहितम् ॥

मनातनत्वादिदानामध्यायगतं पञ्च ॥

तदाष्टपञ्चाभिहितम् । इति त्वादपि दर्शितम् ।

वाक्यमस्यैव विनयात् पञ्चित्वाऽपि दर्शितम् ।

चिकित्सितानामपि तन्मे निदिष्टम् ।

• अर्धवशात् सविशमध्यायगतं तन्मे शेषानप्यान् व्याख्यास्यामः ।

धारयिता तु विनयः सत्तम् परमम् ।

उपार्थः सविशमध्यायगतं तन्मे शेषानप्यान् व्याख्यास्यामः ।

that at the end of no other sections do we find a similar passage. He also writes "Thus one hundred and twenty chapters are described" but adds "The other diseases shall be described in the Uttara Tāntira" the latter part no doubt is an interpolation of the Supplementor. Moreover, in the opening lines which serve as a preface to the sixth part, the authority quoted for the diseases of the eye is Nani, the king Janaka of Mithilā and not Dhanvantari¹. But in the first chapter of the first section, it is described that the sages wanted Dhanvantari to teach them Śalyatāntira or Major Surgery only and he consented to their request. And this subject he treated in detail in the five sections of the book. In the Supplement, on the other hand, are described the other branches of the science such as Minor Surgery, Inner Medicine, &c. Probably this part was added afterwards to give completeness to the treatise, and the original Suśrūta was called Viddhya or the Old by the commentators to distinguish him from the Supplementor.

Suśrūta's work is specially important to us as having two whole chapters (vii and viii of Section I) devoted to the descriptions of Surgical Instruments and one whole chapter (xv of Section I) to the principles of Surgical Operations.

The age of Suśrūta is also involved in obscurity. Nothing can be ascertained from the fact that he was a son of Viśvāmitra²,

¹ अयायानां शते विमे यदुक्तमहम्भया ।
 वदामि बहुधा सम्यगुत्तरेऽर्थानिमानिति ॥
 इदानीन्तत् प्रवदामि तन्ममुत्तरमुत्तम ।
 निखिलेनीपदिश्यन्ते यत्र रोगा पृथग्विधा ॥
 शलाक्यशस्त्राभिहिता विदेहाधिपकौर्त्तिता ॥

Suśrūta Samhitā, VI 1.

² Viśvāmitra is the *gotra* name, so the simple name may either refer to the great Viśvāmitra or to his descendants.

for the age in which the latter lived is not known to us. But he must have flourished during the Vedic Age as many Vedic Hymns are ascribed to him. In the Mahābhārata, Suśruta is mentioned as one of the sons of Viśvāmitra¹ and in the Suśruta Samhitā the author is often described as his son. The age of the great epic has, with good reasons, been fixed at 1000 B.C. So Suśruta must have flourished much earlier. The latest limit which we can assign to Suśruta is 600 B.C. as "there are indications in the *Śatapatha Brāhmaṇa*, a secondary Vedic work, that the author of it was acquainted with the doctrines of Suśruta" as regards the Osteology. "The exact date of that work is not known, but it is with good reason referred to the sixth century B.C." Again in the Atharva Veda, in the tenth book, there is a hymn on the creation of man in which the skeleton is described according to Ātreya and Suśruta². "The large portion of it (Books I to XVIII) indeed admittedly belongs to a much earlier period, possibly as early as about 1000 B.C., and the hymn in question is included in this older portion."³ This shows that Suśruta could not have flourished later than 1000 B.C.

Again in Hasti-Āyurveda, a book on the Treatment of

• ¹ ज्यामायनीष्य माद्विष जावदिमनुतमद्या—

+ + + + +

विश्वामित्रात्मजा नमो मुनयो ब्रह्मादिभ्यः "

Mahābhārata Anuśāsana Parva C. IV

² See R. A. S., 1905, P. 915-1907, P. 1

Hemlock Seeds with Medical Properties, P. 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 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691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 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1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173

Elephants by Pālakāpya, we find the Surgical instruments described after the manner of Suśruta. Pālakāpya lived as a Veterinary Surgeon in the Court of Romapāda, King of Anga, which had as its capital the famous town of Campā, identified with the modern town of Bhāgalpur. King Romapāda was contemporary with king Daśaratha, the father of Rāma, the hero of Rāmāyana.¹ Here we have a corroborative evidence of the age of Suśruta.

Suśruta is mentioned in the *Vārttikas* of Kātyāyana² who flourished during the fourth century B.C.

We have alluded to Nāgārjūna,³ the Buddhist Chemist, as the redactor of the Suśruta Samhitā. He is said to have been a contemporary of king Kaniska that is about the first century B.C.

Another revision was undertaken by Candiate, the son of Tisata, the author of Cikitsā-kalikā. He revised the text which must have fallen then into a state of corruption. The probable date of Candiate is the ninth century A.D.⁴

¹ अग्निं शुश्रूषमाणस्य पितरं च यशस्विनम् ।

एतस्मिन्नेवकाले तु रोमपादं प्रतापवान् ।

Rāmāyana, Vālakāṇḍam, Ch. IX

See also Rāmāyana, 1, 11, 13-20, Mahābhārata, III, 110, 10008-9, Bhāgavat, IV, 23, 7-10

² सुश्रुतेषां प्रोक्तं सीश्रुतम् ।

³ Possibly more than one Nāgārjūna appeared in ancient India as a chemist. Al-Bīrūnī says "He lived nearly a hundred years before our time" (India, I P. 189). Rājatarāṅginī places him in the 3rd century B.C. (I V. 172-173). The modern scholars are of opinion that the founder of the Nāgārjūna system lived in the first century A.D.

⁴ Hoernle's Osteology, p. 100

Commentators —

- 1 Cakrapānidatta—Vānumatī—1060 A D
- 2 Gayadāsa—{Nyāya Candrikā }—11th century A D
 or Pañjikā
- 3 Jejjatācāryya
- 4 Bhāskara
- 5 Mādhava
- 6 Bṛunhadeva
- 7 Dullanācāryya—Nibandha Saṅgraha—12th century A D
- 8 Ubhalta (Kashmir)

Editions—Suśrutā Samhitā has been edited by Madhusūdan Gupta Calcutta, 1835 by J. Vidyāsāgar, 3rd Edition, Calcutta, 1889, by A. C. Karmatna, Calcutta, 1888-95, by Prabhurām Jibamām, Bombay, 1901, and by Vinayānī, Madras.

This book has been translated into English in part only by U. C. Datta 1883, A. Chattopadhyay 1891, Hoernle 1897, Calcutta, in the Bibliotheca Indica. It has been translated into Latin by Hessler and into German by Vulliamy.

The book was translated into Arabic before the end of the eighth century AD. It is called 'Kitab-Shawshom-d-Hrudi

१. श्रीपद्मसूक्तं, तत्र श्रीगुरुर्वाङ्मयः ।

३ पाणि ३ अक्षरमाणा गुणगुणानि निदिदिदि ।

● ● ● ● ● ● ●

[illegible]

१. संस्कृत २. हिन्दी ३. उर्दू ४. अंग्रेजी ५. बंगाली ६. मराठी ७. गुजराती ८. तमिल ९. कन्नड़ १०. सिंधी ११. पंजाबी १२. संस्कृत १३. हिन्दी १४. उर्दू १५. अंग्रेजी १६. बंगाली १७. मराठी १८. गुजराती १९. तमिल २०. कन्नड़ २१. सिंधी २२. पंजाबी २३. संस्कृत २४. हिन्दी २५. उर्दू २६. अंग्रेजी २७. बंगाली २८. मराठी २९. गुजराती ३०. तमिल ३१. कन्नड़ ३२. सिंधी ३३. पंजाबी ३४. संस्कृत ३५. हिन्दी ३६. उर्दू ३७. अंग्रेजी ३८. बंगाली ३९. मराठी ४०. गुजराती ४१. तमिल ४२. कन्नड़ ४३. सिंधी ४४. पंजाबी ४५. संस्कृत ४६. हिन्दी ४७. उर्दू ४८. अंग्रेजी ४९. बंगाली ५०. मराठी ५१. गुजराती ५२. तमिल ५३. कन्नड़ ५४. सिंधी ५५. पंजाबी ५६. संस्कृत ५७. हिन्दी ५८. उर्दू ५९. अंग्रेजी ६०. बंगाली ६१. मराठी ६२. गुजराती ६३. तमिल ६४. कन्नड़ ६५. सिंधी ६६. पंजाबी ६७. संस्कृत ६८. हिन्दी ६९. उर्दू ७०. अंग्रेजी ७१. बंगाली ७२. मराठी ७३. गुजराती ७४. तमिल ७५. कन्नड़ ७६. सिंधी ७७. पंजाबी ७८. संस्कृत ७९. हिन्दी ८०. उर्दू ८१. अंग्रेजी ८२. बंगाली ८३. मराठी ८४. गुजराती ८५. तमिल ८६. कन्नड़ ८७. सिंधी ८८. पंजाबी ८९. संस्कृत ९०. हिन्दी ९१. उर्दू ९२. अंग्रेजी ९३. बंगाली ९४. मराठी ९५. गुजराती ९६. तमिल ९७. कन्नड़ ९८. सिंधी ९९. पंजाबी १००. संस्कृत

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 84

and also mentioned as "Kitab-i-Sūsūt" or Book Sūsūt by Ibn Abīl-saibīal Rhazes often quotes Saad as an authority in Surgery ¹

VĀGBHATA I

The next author of celebrity and whose work is still extant is Vāgbhaṭa I or Vāgbhata the elder, the author of *Astāṅga Saṁgraha* (i.e., Compilation of the Octopartite Science) In later times, a namesake of his, wrote another work called *Astāṅga Hrdaya Samhitā* (or the best Compendium i.e., the Heart of the Octopartite Science) In the *Uttara Sthāna*, Vāgbhata the younger distinctly states that his Compendium is based on the Compilation of Vāgbhaṭa the elder ²

As regards the age of Vāgbhata the elder, there is the same uncertainty as with his predecessors We are however sure that he is posterior to Caraka and Sūsūta for he refers to these writers by name ³

The chronological relation of the three early authors is described in a popular couplet that Ātreya, Sūsūta and Vāgbhata were the three great medical authors for the three Yugas—

¹ "His next description is from an author named Saad, whom he frequently quotes in other parts of his works".

Adam's Commentary on Paulus Æginetta, VI 111

² अष्टाङ्गवैद्यकमहीदधिमुख्येन योऽष्टाङ्गसग्रहमहाम्तराशिरास ।

सम्मादनलफलमल्पसमुद्यमाणा प्रीतर्धमेतदुदित पृथगेव तत्त्वम् ॥

Astāṅga Hrdaya Samhitā, *Uttara Sthāna*, Ch XL, v 82

³ By name, e.g. in *Samgraha*, Bombay ed., Vol I, P 246, Vol II, P 421 Again quoted from *Caraka*, *Ibid*, Vol I, pp 20, 93, Vol II, pp. 212, 213, *et passim*, from *Sūsūta I*, *ibid*, Vol I pp. 109, 121, 177, 247, Vol. II, p 303, *et passim* (Hoernle)

the Tretā, Dvāpara and Kali, respectively.¹ They are known as the Vrddha Trayī or the Old Triad. This medical tradition goes much against the conclusion of Dr Hoernle that Vāgbhata I must have flourished early in the seventh century A.D. One of the reasons put forward by him is the fact, that "the Buddhist pilgrim I Tsing, who resided ten years in the Nalandā University (in Bihār) from about 675-686 A.D., states in *Records of Buddhist practices* that the eight arts (*i.e.*, the branches of medicine) formerly existed in eight books but lately a man epitomised them and made them on one bundle (or book)". Professor Jolly understands by it the Suśruta Saṁhitā while Dr. Hoernle points out with more reasons that it refers to Vāgbhata I's work, the Astāṅga Saṁgraha (*i.e.*, the Compilation of the Octopartite Science) and rules out Suśruta by the word "lately".² But the description that I Tsing gives of the contents of the book does not warrant any reference to either. Moreover, he has not given any reason why Vāgbhata II's book Astāṅga Hrdaya Saṁhitā (the best Compendium of the Octopartite Science) might not be alluded to by I Tsing. Dr Hoernle, however, rules him out by date for "he can not be placed earlier than the eighth century"—an assertion unsupported by any evidence whatsoever. All that he has proved is that. Accordingly it is probable that all these three medical writers (Mādhava, Dharaṇīśekhara and Vāgbhata II) come in the period from the 7th to the

9th century A D¹ at no very great interval from one another," and this proof is based on the age of Vāgbhata I as suggested by I'Tsing's remarks. Thus he has taken for granted what he is required to prove. He has shown that Suśruta is anterior to Vāgbhata I, and Vāgbhata II is posterior to him. But in trying to prove that Vāgbhata I lived in the seventh century he cannot assume that Vāgbhata II lived in the eighth. Another evidence adduced in support of his conclusion is the fact that the non-medical version of the list of bones of the human body as contained in the Law-book of Yājñavalkya presupposes earlier uncorrupted forms of lists of bones both in Caraka and Suśruta, and "the corrupt recension, traditionally handed down, must have come into existence at a later date," that is to say, between the date of Yājñavalkya (350 A D) and Vāgbhata I, the latter of whom is proved to have copied from the corrupt recensions of Caraka and Suśruta. Thus the older recensions still existed in the fourth century A D and if we add to it the interval of time necessary for the texts to have fallen into a state of corruption, we get the early seventh century A D for Vāgbhata I. But we must remember that there is nothing to prevent against the supposition that Vāgbhata I lived before Yājñavalkya. There might have been two recensions of the texts available during Yājñavalkya's time, one corrupted and it might or might not have been the work of Vāgbhata I and another true version which was availed of by the sage Yājñavalkya. And similar events have happened, as has been pointed out by Dr Hoernle himself, in our own generation Gangādhara's recension of Caraka is a corrupted form of the text,

while the recension given in Jibānanda's edition is the traditional text of Caraka. No critic would I think jump into the conclusion that Gaṅgādhar lived three or four centuries after Jibānanda. Again if it be true, as he contends, that Suśruta was redacted by Vāgbhata I, we could easily imagine that Yājñavalkya copied his list bones from the original Suśruta and not from the redaction of Vāgbhata I. So we see that the age assigned to Vāgbhata I, or the seventh century AD can not be accepted as proved. Dr Hoernle says "It should, however, be understood that these conclusions regarding the date and authorship of Vāgbhata I, are not put forward as established fact."

Let us recapitulate the objections that can be urged against the conclusion that Vāgbhata I lived in the seventh century AD.

1. Vāgbhata I is believed by the Indian medical men to have flourished long before the Christian era. By some he is connected with the court of Yudhisthira, but his name is nowhere mentioned in the Mahābhārata. Ātreya, Suśruta and Vāgbhata are described as the Old Triad or Vaidhya Triad and they were the authorities for the Triśiḍḍhant and Kalyāṇ respectively. It is curious to observe that Dr Hoernle, arguing against the conclusion of Prof. Jelliffe that Suśruta meant by ITsing, takes advantage of the Indian tradition that Suśruta flourished during pre-Christian times. He does not mention the same tradition in regard to Vāgbhata I which goes against his own conclusion. On the other hand, the Chinese records mention the existence of Vāgbhata I.

Octopartite Science, no doubt, agrees very well with the description of I'Tsing that "lately a man collected them into one bundle" But Vāgbhata II's book "The best Compendium of the Octopartite Science" is equally suggestive, though Dr Hoernle says "it cannot prevail by the side of the more suggestive name of the rival work of Vāgbhata the elder"

3 Again in arguing against Prof Jolly, Dr Hoernle has attached much importance to the word "lately" by which Suśruta is ruled out by date. Admitting the validity of such reasoning, it does not follow that by the word "lately" I'Tsing meant any contemporary author or any one who preceded him by a short period only. To comprehend the meaning of the sentence we must understand the word "lately" in connection with the word "formerly" used before¹. Now the sentence "The science of medicine formerly existed in eight books" no doubt refers to the division of Āyurveda into eight parts by Brahman and to the treatises on the different branches of Medicine by Agniveśa, Suśruta and others. These treatises are believed to be of remote antiquity, and so any later compilation may be spoken of as recent in comparison with the old treatises of unknown ages. Thus the word "lately" may refer either to Vāgbhata I or Vāgbhata II, but the latter author's claim to the honour becomes reasonable considering his decided posteriority to the former and so coming within the limit of the time suggested by the word "lately"

4 Again I'Tsing refers to a book which was recognised as the standard throughout India. This may refer either to

Vāgbhata I or II. But if Vāgbhata I's book occupied such a position at the time of I Tsing, it becomes difficult to imagine why Vāgbhata II should write another work principally based on the work of Vāgbhata I after a lapse of a century or so. Moreover, we find at the present time, that Vāgbhata II's book *Astāṅga Hridaya Samhitā*, has a wider popularity than the book *Astāṅga Samgraha* of Vāgbhata I. The former has been printed many times and is widely read by the students,—so much so Vāgbhata is generally known as the author of *Astāṅga Hridaya Samhitā*.

5. Moreover, the Arabian physician Rhazes, who is said to have lived in the ninth century (882 AD) in treating of the property of ginger, the common plantain or musk and other drugs, quotes from an Indian writer, whom he calls Sindicua or Sindicari.¹ Royle says: 'But in the article De Allio another Indian author is quoted whom I have not been able yet to trace out—*Aut Sindifer* (in another place written '*Deit sindichet*') *imbecillus valet contra Ventositatem*. This Sindicua is identified with Vāgbhata II of Sindh whom in his time known as a second Canka or Cank (the syllable 'k' making no difference, as in words like bāb' and bāb' both meaning a child). We know that the Vāgbhata's *Astāṅga Hridaya Samhitā* was one of the medical works translated by the order of Caliphs in the eighth century.

6. The translations of the *Cāraka Saṁhitā* and *Vāgbhata* occur in the *Tibetan Treasury of Knowledge*.²

¹ *De Materia Medica*, p. 105.
² *Chinese Materia Medica*, p. 105.
³ *Chinese Materia Medica*, p. 105.
⁴ *Chinese Materia Medica*, p. 105.
⁵ *Chinese Materia Medica*, p. 105.

who has recently critically examined the contents of the Tanjur, concludes that the most recent date at which it can be placed is the 8th century A D"¹

So I cannot avoid the conclusion that of the three authors, Suśruta, Vāgbhata I and II, to which I'Tsing's remarks may refer, the last has probably the best claims to that reference, and the date assigned to Vāgbhata I may well suit Vāgbhata II *ie*, "as late as the early 7th century A D,"² and possibly still earlier.³ Again it is impossible for us to say whether I'Tsing's remarks may not appropriately refer to other authors whose works are lost to us

Mention should also be made of the fact pointed out by Dr Cordier that Vāgbhata is mentioned in Rājataranginī and his date is fixed there as 1196-1218 A D⁴

But the name of Vāgbhata does not occur in Stein's edition of Rāj, which is no doubt the most reliable, and so we can easily dismiss this view as untenable

Editions—Vāgbhata I's book *Aṣṭāṅga Samgraha* has been printed in Bombay

Commentary—Arunadatta—about 1220 A D

¹ P C Rāy's History of Hindu Chemistry, Intro, P XXIX

² Hoernle's Osteology, Intro, p 10

³ Dr Kunte places him "at least as early as the second century before Christ," Vide his Intro to Vāgbhata's *Aṣṭāṅga Hṛdaya Samhitā*.

⁴ सिङ्गुप्तसुत. परमवैद्वी वाग्भटाचार्य कास्मीरनगरपति जयसिंहस्य प्रजापालन समये (खृ हादश शताब्द्याम्, शक १११८—४०) वर्तमाना आसीत् ।

Quoted in Cordier's *Vāgbhata et L'Aṣṭāṅga Hṛdaya Samhitā*, 1896

See Intro to the *Vaidyākāśabhasindhu* by *Kaṁarāja Umeśendra Gupta*, 1894.

VĀGBHATA II

The next great authority in Hindu medicine is Vāgbhata II, son of Simha Gupta, an inhabitant of Sindh¹. His work, *Aṣṭāṅga Hṛdaya Samhitā*, the author himself states, is based on the summary of Vāgbhata the elder². In the first chapter of *Sūtra Sthāna*, he acknowledges the help he received from the works of Agniveśa, Hārīta, Bhela, and others³. The fact that Caraka is not referred to here as one of the sources of Vāgbhata II has been taken advantage of by some to prove the posteriority of Caraka⁴. They conclude that Agniveśa and Suśruta wrote their works long before him, and the Agniveśa Tantra was not called by the name of, and in fact was not as yet edited by, Caraka, at the

- 1 भिषग्वरी वाभट इत्यमुने
पितामही नामधरीऽपि यस्य
मतोऽभवत्तस्य च मिरगुप्त
तस्याप्यस्मिन् सिन्धुसु जातजन्मा ॥

Aṣṭāṅga

- 2 *Aṣṭāṅga Hṛdaya Samhitā*, Uttara Sthāna, Ch. XL, v. 82

See foot note 2, p. 18.

- 3 प्रक्षा रमत्वाऽऽयुषी वेद प्रजापतिमजिदरन् ।
सोऽश्विनो तौ सरसाथं सोऽपिपुसादिकामुनीन् ॥२॥
तैऽपिषेजादिकांस्तु पृथक् तन्नापि तेजिरी ।
तैऽपिऽतिविप्रकीर्णैः प्रायः सारतरीश्वर ।
वियतेऽष्टाद्वदधं नातिमदेषदिसरन् ॥३॥

Aṣṭāṅga Hṛdaya, S. 103, v. 10, C. 1

* It would appear also that at the time Vāgbhata lived Agniveśa's work was not called by the name of Caraka, and Suśruta's was not yet written. Hence it follows that Caraka is a name of a work which was not now called Caraka was probably current before Suśruta's time.

time Vāgbhaṭa II flourished. The argument is however not conclusive, it only shows that the Agniśa Tantra was available to Vāgbhaṭa II in its original form. No definite results can be expected from this *argumentum ex silentio*. Again it may easily be imagined, and I think it is the right view of the question, that Caraka lived and edited Agniśa's work long before Vāgbhaṭa, the reason of Caraka being not mentioned in Vāgbhaṭa's book, is the fact that Caraka did not usurp the authorship of Agniśa Tantra but clearly states at the end of each chapter the real nature of his share in the authorship of his book in the following words — "Here ends the chapter of Agniśa Tantra as corrected and edited by Caraka." Many modern text books of medicine have been edited and improved, though the books are still called after the original authors. Moreover to make Caraka flourish after Vāgbhaṭa II would bring him to quite modern times.

We are however arguing on false premises. Though Caraka is not mentioned in the Sūtra Sthāna of Astānga Hṛdaya, his name occurs in the Uttara Sthāna¹. So there can be no doubt that Caraka's edition of Agniśa was current in India long before Vāgbhaṭa II wrote his Astānga Hṛdaya Samhitā.

¹ यदि चरकमधीति तदधुव सुश्रुतादि

प्रणिगदितगदाना नाममात्रेऽपि वाच्यः ।

अथ चरकविहीन. प्रक्रियायामखिन्न

किमिह खलु करीतु व्यधितानां चरकः ॥४६॥

* * * *

ऋषिप्रणीति प्रीतिश्रेण्डुका चरकसुश्रुतौ ।

भेडाद्या किं न पठ्यान्ते तस्माद्वाच्य सुभाषितम् ॥५३॥

Astānga Hṛdaya Samhitā, (Ed. Vijayratna Sen),
Uttara Sthāna, Ch. XI

Editions—There are various editions of the book but the following are reliable —

- 1 By Dr Anna Morčvara Kunte, M D, 2 vols, Bombay, 1880, 2nd Ed, 1891
- 2 By Jibānanda Vidyāsāgara, Calcutta, 1882
- 3 By Vijayratna Sen Kaviśaṅkara, Calcutta 1885-90
- 4 By Ganēś Sastrī Tattēvaidya, Bombay, 1888
- 5 In Sanskrit and Bengali with the commentary of Arūnadatta by Vijayratna Sen Gupta, Calcutta, 1888
- 6 In Sanskrit and Guziathi by Behcharlal Nathuram, Ahmedabad, 1889
- 7 In Sanskrit and Bengali by Kāśīa Candra Sen Gupta, Calcutta, 1890-1892
- 8 In Sanskrit and Hindi by Pandit Rabi Datta, Bombay, 1890
- 9 In Sanskrit and Marathi by Ganēś Kṛmā Garh Poonā, 1891
- 10 In Sanskrit and Bengali by Kāśīa Candra Sen Gupta, Calcutta, 1891-1892

Commentaries—

- 1 Sayajīra Saṅgṛah by Anandabhaī, 1220 A D

See also *Author's List* and *Index*

ॐ नमो भगवते वासुदेवाय
ॐ नमो भगवते वासुदेवाय

ॐ नमो भगवते वासुदेवाय

- 2 Āyurvedadaśayana (Dinacharyā Prakaraṇa) by Hem-
' adī or Kamadeva, Raja of Devagiri. It is available
in parts only
- 3 Astāngahrdayaiddya by Aśadhara Sallayana
- 4 Padāṭhacandrikā by Candiacandana
- 5 Sanketamañjarī by Dāmodara
- 6 Astānga Hidayatikā by Rāmanāth Vaidya
- 7 Vālaprobodhikā (Anonymous)
- 8 Hidayabodhikā „
- 9 Pāthya
- 10 Vāgbhataṭṭha Kaumudī by Hari Kṛṣṇa Sen Mullick.
- 11 Pradīpa by Jaśodānandan Saikār, 1298 B S

VĀGBHATA III

The author of Rasaratna Samuccaya in the Colophons at the end of each chapter identifies himself with Vāgbhata II "Here ends Book first (or so) of R R S composed by Vāgbhata son of Simha Gupta, prince of physician" The salutation at the beginning of his book is strictly Buddhistic The probable date of the book is "placed between the thirteenth and fourteenth centuries A D"¹ "The chemical knowledge, as revealed in Vāgbhata is almost on a par with that in the Suśruta," whereas the R R S indicates an advanced state of that science He quotes Rasārnava as a source of his information, he does not mention opium as a medicine, and the Fīranga roga and its treatment find no place in his book

¹ P C Rāy's History of Hindu Chemistry, Intro, p. 11

MĀDHAVAKARA

He is the author of the famous work on Pathology or Nidāna. His book was translated into Arabic by the order of Harun-Al-Rasid and so the most recent date that can be assigned to him is the seventh century A.D.¹ Thakore Saheb of Gondal identifies him with Mādhavācāryya, the celebrated author of Saivadarśana Saṅgraha, the brother of Sūyana, the commentator of the Vedas.² I do not find any authority for such an assertion and here is an example of fallacious reasoning based simply on the identity of names. Mādhavācāryya and Sūyana lived in the twelfth century A.D. Mention should also be made of the view expressed by Dr. Hoernle as certain that Mādhavakara, the author of Nidāna and Vrnda Mādhava, the author of Siddhayaoga are one and the same person. He holds that Vrnda is the real name, but he was known to the commentators as Mādhava for his melodious diction. There is no proof given of this opinion, and we have reasons for not accepting it. However as he does not treat of surgical instruments, his work is not important to us.

CAKRAPĀṆIDATTA

Cakrapāṇidatta or more commonly Cakradatta in a Catalogue³ has given an account of himself in his book. Cakr

¹ Jolly's *Indian Medicine*, ff. 5-6, pp. 7-9.

² *History of Ayur Medical Science*, Ch. II, p. 35.

नैडाधिन्याय रसव्याधिरासिदाय—

नारायणस्य तन्त्रं सुप्रसिद्धम् ।

भारतवर्षे प्रसिद्धं तन्त्रं हि ।

शैलशालिनि रसव्याधिरासिदाय ।

Cikitsā Sāra Saṁgraha "The author of this work is Śrī Cakrapāṇi who belongs to the family of Lodhīavalī, and who is the youngest brother of Vānu and the son of Nārāyaṇa, the superintendent of the kitchen of Nayapāla,¹ the king of Gour" This book is arranged on the plan of Vrnda in his Siddhayoga² which again follows closely as a companion volume to Mādhava's Nidāna³ The age of Cakradatta is about 1060 A D, and Vrnda must have flourished between Mādhava and Cakrapāṇi for he quotes the former while he is himself quoted by the latter So the probable age of Vrnda is the ninth century A D Besides being a celebrated author, Cakradatta wrote excellent commentaries of Caraka and Suśruta His extant works are—

1 Cikitsā Sāra Saṁgraha or Cakradatta A treatise on
Medicine

¹ For the date of Nayapāla, vide Cunningham's Archæo Survey of India III P 119, also J A S LX Pt I P. 40 Life of Atisa by S C Dīś

² य सिद्धयोगलिखिताधिकसिद्धयोगा—

नवैव निश्चिपति केवलमुद्धरेत् ।

भट्टत्रयत्रिपथवेदविदा जनेन

दत्त पतेत् सपदि मूर्धनि तस्य शापः ॥

Sloka at the end of the Cakradatta.

य इत्यादी ।—सिद्धयोग इति वृन्दकृतसमूहस्य सज्ञा, तद्विहितयोगमपेक्ष्याधिका ये च सिद्धयोगा अत्र समूहे चक्रास्त्रानधिकयोगान् तत्रैव सिद्धयोगे निश्चिपति, तथा यो वा तानधिकसिद्धयोगानित समूहादुद्धरेत् दूरीकुशेत्, तस्य मूर्धनि वृद्धेन पुसा दत्तः शापः पतेत् । कौटुशेन पुसा ? भट्टत्रयत्रिपथवेदविद्या । कारिका वृद्धीका चन्द्रटीकेति भट्टत्रय, त्रिपथवेद ऋग्यजु सामरूपः, तद्विदा ॥

Śibadāsa Sen's Commentary

³ वृन्देन * * * * * सलिख्यते गदविनिश्चयक्रमेण ॥

Vrnda's Siddhayoga

- 2 Cakradatta or Materia Medica—It treats on drugs applicable to a number of diseases.
- 3 Mukṭābali—This treatise on the nature and properties of medicinal drugs is ascribed to Cakrapāṇi.
- 4 Vānumati—Commentary on Suśruta Samhitā.
- 5 Cakratattvadiṇikā—Commentary on Caraka Samhitā.

Editions —

- 1 Cakradatta or Cikitsā Sāra Samgraha edited by Kācārāja Pyāri Mohan Sen Gupta, Calcutta, 1295 B.S.
- 2 Cakradatta with Bengali translation by Chandramūṇi Dās Kavibhusin.
- 3 Cakradatta with Bengali translation and with commentary of Śiva Dās Sen, by Jāśodā Nandan Sanyal, 1302 B.S.

SĀRANGADHARA

He wrote Sārangadhara Samgraha. It is compiled from the works of Caraka, Suśruta, Vāgbhata and others. It is very popular in Western India. It treats on the theory and practice of Medicine. He was the son of Dharmadeva and flourished in the fifteenth century A.D.

Editions — By Kācārāja Pyāri Mohan Sen Gupta, Calcutta, 1296 B.S.

संस्कृत-संग्रहः
 सारंगधरा-संग्रहः
 सारंगधरा-संग्रहः
 सारंगधरा-संग्रहः

Commentary—Sārangadharaṭikā It is a commentary on the above work by Adhamulla

BHĀVA MIŚRA

About 350 years ago, a compilation was made by Bhāva Miśra, son of Lataka Miśra, an inhabitant of Benares, from the most celebrated medical works and was called Bhāva Prakāśa¹ He lived about 1550 A.D. and was considered a "Jewel of Physicians and Master of Śāstras" He mentions China root called Tob Chin² in the Vernacular as a remedy of Frangula or Syphilis³ which he describes for the first time in India He was the first to make mention of certain drugs of foreign countries as Badhkshani Naspasi,

- ¹ आयुर्वेदाश्रितमव्यादतिमतिमुनयो योगरत्नानि यदा-
लम्ब्या स्त्रे स्त्रे निवन्नेदधुरखिलजन व्यधिविभ्रसनाय ।
तत्तद ग्रन्थादगृहीते सुवचनमणिभि र्भावमिश्रयित्किम्सा
शस्त्रे जाद्यान्वकार प्रशमयितुमिह सन्विधत्ते प्रकाशम् ॥

Bhāva Prakāśa, I. 1

इति श्रीमिश्र लटकतनय श्रीमन्मिश्रभावविरचिते
भावप्रकाशे षष्ठ प्रकरण सम्पूर्ण ॥

Colophon at the end of Section I.

- ² हीपालरवचा किञ्चित्किरीणा वज्रिदीप्तिहत् ।
विवन्वाभानशूलघ्नी शक्नुन्मूत्रविशोधिनी ॥
वातव्याधीनपद्मारसुन्माद तनुवेदनाम् ।
व्यपीडति विशेषेण फिरङ्गामयनाशिनी ॥

Bhāva Prakāśa, I. i

- ³ फिरङ्गसङ्गके देशे बाहुल्येनैव यद्भवेत् ।
तस्मात् फिरङ्ग इत्युक्ती व्याधिव्याधिविशारदै ॥

Bhāva Prakāśa, II. 17

Khorasani and Parasika Vacha (*Acorus Calamus*), Sulemani Khajjura (date fruit of Suleman),¹ and opium •

Editions—

- 1 By Jibānanda Vidyāsāgara, Calcutta, 1875
- 2 By Rasik Lāl Gupta
- 3 By Kālīśa Candia Vidyaratna

Besides these books, the number of Sanskrit medical works is simply legion, many of them are daubed with fancy names and are excellent treatises on the different branches of medical science. But they are quite foreign to our purpose. I intend to publish in a separate volume short notices of the medical authors and their works, and so we need not dwell on them here.

- १ पारसीक यवानी तु यवानी सदृशी गुण ।
विशेषात् पाचनी रुष्या याहिनी मादिनी गुर ॥

Ib. va Pral., I.

पारसीकवचा गुणा प्रोक्ता ऽभवतीति स्म ।
ऽभवत्युदिता तददात जनि विक्षेपत ॥

Ib. d

उक्त खमज्जदलीरमाकृमसिर्पिण्डम् ।

Ib. d

खोनाय नञ् कर्पर कण्डल्यवर रूत

Ib. d

सर्पिणी निम्बानाम् परमेष्ठिद्वयम् ।

Ib. d

CHAPTER II

HOSPITALS AND DISPENSARIES

Before entering into our proper subject, it would not be amiss to notice here two objects—Hospitals and Anæsthetics—which are essentially necessary for the development of surgical knowledge. We know from the Edict II of Aśoka that India during his reign was studded with hospitals not only for the treatment of human beings but also for the brute creations. But even before Aśoka, hospitals flourished in India. In Caraka we can trace the germ of such an institution though it was used for rich men and did not accommodate the public ¹

¹ दृढ निवात प्रवातेकदेश सुखप्रविचारमनुपत्यको धूमातपरजसामनभिमनीयमनिष्टानाञ्च शब्द-स्पर्श-रस-रूप गन्धानां सीपानीदमलमुपलवर्चं ग्यानमनभूमिमहानसीपित यास्तुविद्या-कुशल प्रशस्त गृहमेव तावत् पूर्वमुपकारयेत् ।

ततः शीलशौचानुरागदाह्यप्रादक्षिण्योपपन्नानुपचारकुशलान् सर्वकर्मसु पर्यवदाताम् स्पीदनपाचकस्त्रापकसवाहकोल्यापकसवेशर्कापधपेकाश्च परिचारकान् सर्वकर्मस्वप्रति-कुलान् । तथा गीतवादित्रीलापकस्त्रीकगायाध्यायिकेतिहास-पुराणकुशलानाभिप्राय-ज्ञाननु-मतांश्च देशकालविद परिपद्यांश्च । तथा लावकपिञ्जलशङ्करिणैककालपुच्छकम्बुमातृकी-रमान् । गाञ्च दीग्ध्री शीलवतीमनानुरा जीवद्वत्सा सुप्रतिविहिततणशरयपानीयाम् । जल-पात्राचमनीदकीष्टमणिकपिठरघटकुम्भीकुम्भकुण्डशरावदर्वीकपरीपचनमन्यानचेलसूत्रकार्पासी-र्णादीनि च शयनासनादीनि चौपन्यस्तम्भद्वारप्रतियहाणि सुप्रयुक्तान्तरणीत्तरप्रच्छदी-पधानानि स्त्रापायथानि सवेशनोपवेशनक्षेहस्वेदाभ्यङ्गप्रदेहे परिपेकानुलिपनवमनविरेचना-स्थापनानुवासन-शिरीविरेचनमूचीञ्चारकम्भणामुपचारसुखानिसुप्रचालितोपधनाञ्च स्रग्णखर-मव्यसा दृशद शस्त्राणि चौपकरणार्थानि ।

धूमनेत्र वस्तिनेत्रघोत्तरवस्त्रिकञ्च । कुशहस्तश्च तुलाश्च मानभाण्डश्च घृततैलवसामञ्जवीद्र-फाणितलवणेन्मनीदक-मधुसुरासौवीरकतुपीदकमैरेयमेदकदधिमण्डोदप्रिवृज्जानाम्नाम्रमूचाणि च । तथा शालिपष्टिकमुद्रमापयधतिलकुलव्यधदरम्भद्वीकापरूपकाभयामलकविभीतकानि नाना-विधानि च क्षेहस्वीदापकरणानि द्रव्याणि तग्नैवीर्यहरणानुलीमिकीभयभाञ्जि सयहनीयदीप-भीयपाचनीयीपशमनीयधातहराणि समान्ध्यातानि चौपधानि यद्वाय्यदपि किञ्चिद्वापद परिसव्यायीपकरण विद्यते यच्च प्रतिभीगाथ तत्तदुपकल्पयेत् ॥

He advises us as follows —The engineer is to erect a strong and spacious building well-ventilated at one part the other part being free from draughts. The scenery should be pleasing and one should feel happy to walk in it. It must not be behind any high building, nor exposed to the glare of the sun. It should be inaccessible to smoke and dust. There must not be anything injurious to our senses as regards sound, touch, taste, form and smell. There should be stoves, large wooden mortars and pestles, and there must be additional bare ground for the construction of a privy, bath-room and kitchen. The staff should consist of servants and companions. The servants should be good, virtuous, pure, fond, clever, generous, well trained in nursing, skilful in works, able to cook rice and curries well, competent to administer a bath, expert masseurs, framed in raising and moving a patient, dexterous in making or cleaning beds, practical in the art of compounding medicines and willing workers not likely to show displeasure to any order. The companions should be good singers and musicians, fluent speakers, well-versed in districts, ballads, tales, history and mythology, well-acquainted with the diseases of a patient's nads or signals, agreeable and should have knowledge of the season and the locality. The various kind of attendants

From the *Journal of Medicine*, 1881, Vol. 1, No. 1, p. 1. The author is Dr. J. H. Green, of the University of London. The article is entitled "The Hospital and the Dispensary." The author discusses the importance of the hospital and the dispensary in the treatment of the sick. He argues that the hospital should be a place where the sick are treated with the most skill and care, and that the dispensary should be a place where the sick are treated with the most kindness and sympathy. He also discusses the importance of the nurse and the companion in the treatment of the sick.

THE HOSPITAL AND THE DISPENSARY

By J. H. GREEN, M.D., F.R.C.S.

should always be kept in stock such as Lāva (*Perdix Chinensis*), Kapūjala (partridge), hares, sheep and the different kinds of deers, Ena (the black antelope) blacktailed deer, and Mrgamātrka. There should be a dairy attached to the building. The cow should be good natured and healthy, and should yield profuse milk. The calves must be living. There should be stocked for them potable water and hay in a clean fold. In that building must be kept the following necessary articles.—

Water vessels, washing basins, tubs, jars, dishes, ghata, (small jars) kumbhī, kumbha (larger and smaller vessels), kundu (jug or pitcher), soraba (earthen basins), spoons or ladles, cooking utensils, churning rods, cloth, thread, cotton, wool, bedding and āsana (seats). Near them should be placed drinking vessels of gold and spittoons. The bedding should consist of a broad carpet, bed-sheet, pillows, and a bedstead. There should be collected good furnitures for beds and seats, and also utensils and appliances for application of oleaginous medicines, heat, oil, ointment, bath and perfumes, and for the acts of emesis, purgation, draining of the brain, injection into the rectum, defaecation and urination (i.e. Vastīyantra, urinal, bed-pan &c). The blunt and sharp instruments and their accessories, well-washed malleis and whetstones of different degrees of smoothness—polished, plain or rough—should be near at hand, the tubular instruments for fumigation, inhalation and injection into the rectum, urethra and vagina, should be available there, and the following articles are also to be stocked—brushes and brooms, weighing scales and weights, ghee (melted butter), oil, fat, marrow, honey, molasses, salt, wood, water, spirituous liquor formed by steeping husked grains of barley in water, or by boiling together the husks of fried māskalāya

(pulse of Phaseolous Rox), barley and water, spirituous liquor from the blossoms of *Lythrum Fruticose* with sugar, spirit distilled from the different sorts of grains, curdled milk, rice, gruel, whey, sour liquid produced from the acetic fermentation of powdered paddy, and the various kinds of urines of animals. Different kinds of rice such as *Śūli* (or that reaped in cold season) and *Sasthika* (or that grown in hot weather in low lands and reaped within sixty days of its sowing), *Mudga* (*Phaseolus mungo*), *Māsa* (*Phaseolus Rox*) *Yava* (*Hordeum Vulgare*), sesame (*Scasamum Indicum*), *Kullatha* (*Dolichos Biflorus*), plums (*Zizyphus Jujube*) raisins (*Vitis Vinifera*) *Purusa* (*Grewia Asiatica*), *Abhaya* (*Chebulic Myrobolan*), *Āmlakī* (*Phyllanthus Emblica*), *Vibhitāla* (*Terminalia Bellerica*) and other classes of medicaments, as oils, diaphoretics, sternutatories, cathartics, emetics, purgatives, astringents, stomachics, digestives, calmatives, cumminative and various other forms of medicines, are required for treatment. Besides these, there must be stored the antidotes to poisons caused by overdoses of medicines and other appliances likely to add to the patient's comfort.

To this may be compared the description of the *Oratorium*, which is mentioned in the Hippocratic treatise, *De Medicis*. He directs that 'it should be constructed in such a way that the wind nor sun might prove offensive to the patient, and goes on to enumerate the various articles which it should contain such as scalpels, lancets, cupping instruments, syringes, sponges with bandages and medicines.'¹

¹ We use Hippocratic *Sect. Sec. V. Lib. 47* for this.

Suśruta gives us a list of appliances¹ required in surgical operations.—

1 Blunt Instruments 2 Sharp Instruments 3 Potential Caution 4 Actual Caution 5 Śalākā or rods 6 Horns 7 Leeches 8 Hollow bottle gourd 9 Jāmbav-oustha [a bougie of blackstone, the extremity of which is shaped like the fruit of the Jambul tree (*Urginea Jāmbolana*)] 10 Cotton 11. Pieces of cloth 12 Thread 13 Leaves 14 Materials of bandaging 15 Honey 16 Ghee, or clarified butter 17 Suet 18 Milk 19 Oils 20 Taipan—flour of any perched grain or condensed milk etc mixed with water to mitigate thirst 21 Decoctions 22 Liniments 23 Plasters 24 Fan 25 Cold and hot water 26 Iron pans, kalasī and other earthen vessels, beddings and seats 27 Obedient, steady and strong servants

The Lying-in-room—Caraka says “Before the ninth month of pregnancy, the lying-in-room should be constructed. The land should be cleaned of bones, gravels and potsherds. The ground selected should be of auspicious colour, taste and smell. The gate of the house should face towards the east or the north.² There must be a store of wood such as *Vilva* (*Ægle*

¹ अतोऽनामत कर्म चिकीर्षता भयेन पूर्णमेवोपकल्पयितव्यानि तद्यथा यन्त्रशस्त्रचारादि-
शलाकाशङ्खजलीकालावूनाम्बोष्ठपिचुर्ध्वोत्तमपत्रपद्मधूततमसापयस्नेहतर्पनकपायलेपन कम्क-
व्यजनशीतोष्णोदक कटाहदीनि पारकर्मणश्च सिग्धा. स्थिरा बलवन्तः ।

² “The best sort of ground should abound with milky trees, full of fruits and flowers, its boundary should be of a quadrangular form, level and smooth, with a sloping declivity towards the east producing a hard sound, with a stream running from left to right, of an agreeable doom, fertile, of an uniform

Mammos Tinduka (*Diospyros Embryopteris*), Inguda (*Balanites Rox*), Bhallākaka (*Semecarpus Anacardium*), Vāruṇa (*Ocimum Basilicum*), Khadira (*Acacia Catechu*) or wood of other kind and to be auspicious by a Brāhman versed in the Atharvasaḍa, and there must be a sufficient provision for clothes, liniments and covers. For the pregnant woman, be careful to have a fire-place, water, pestles and mortars, a privy, a bathing place and ovens. These should be constructed according to the science of engineering and should be pleasant with regard to the season. There should be collected clarified butter, oil, honey, different kinds of salts as rock salt, sonchal salt and black salt, Vīḍaṅgis (*Embelia Ribes*), treacle Kuṅṭha (*Saussurea Lappi*), Kīlīmā (*Pinus Deodura*), Nāgarā (dried root of *Zingiber Officinale*), Pippali (*Piper Longum*), its root, Hara-pippali (*Scindapsus Officinalis*), Mandukparni (*Hydrocotyle Asiatica*), Elā (*Elettarium Cardamomum*), Lāṅgoli (*Gleichenia Superba*), Vāra (*Acorus Calamus*), Cava (*Piper Cava*), Chitraka (*Plumbago Zeylanicum*), Chinavilya (*Pongamia Glabra*), Hingu (*Ferula Assafetida*), Sarsapa (Mustard seeds), Lasaṇa (*Alum Sativum*) finely or thickly powdered rice, Kadamba (*Anthocephalus Kadamba*), Ātasi (*Lanum Usitatisum*), Vallī (*Cucurbita Pepo*), Bhūrya (*Bala Bala*), Kūṭa (*Delichos Uniflorus*), Mureya (essence of liquorice), Pūṣpa (*Lathyrus Frutescens*) and Āshva (*Amorpha fruticosa*) and liquorice in sugar or molasses. Rūpa (*Abutilon*)

Chitraka (*Plumbago Zeylanicum*)
 Chinavilya (*Pongamia Glabra*)
 Hingu (*Ferula Assafetida*)
 Sarsapa (*Mustard seeds*)
 Lasaṇa (*Alum Sativum*)
 Rice
 Kadamba (*Anthocephalus Kadamba*)
 Ātasi (*Lanum Usitatisum*)
 Vallī (*Cucurbita Pepo*)
 Bhūrya (*Bala Bala*)
 Kūṭa (*Delichos Uniflorus*)
 Mureya (*Essence of liquorice*)
 Pūṣpa (*Lathyrus Frutescens*)
 Āshva (*Amorpha fruticosa*)
 Rūpa (*Abutilon*)

Chitraka (*Plumbago Zeylanicum*)
 Chinavilya (*Pongamia Glabra*)
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 Bhūrya (*Bala Bala*)
 Kūṭa (*Delichos Uniflorus*)
 Mureya (*Essence of liquorice*)
 Pūṣpa (*Lathyrus Frutescens*)
 Āshva (*Amorpha fruticosa*)
 Rūpa (*Abutilon*)

stone (muller and stone slabs), two pestles, two mortars, an ass, a bullock, two sharp needles of gold and silver, two skins of threads, sharp instruments of steel, two wooden bedsteads (*Ægle Marmelos*), and wood (*Tinduka* and *Ingudi*) for easily igniting fire. The female attendants should be mothers of children, and friends and relatives of the patients. They must be fond of her, skillful in work, intelligent, jolly, labourious full of tender love for the children and a favourite of the mother¹

The Child's Room —He continues—"The engineer is to construct a room, spacious, beautiful, full of light, well-ventilated but free from draughts, strong, and free from beasts of prey, animals with fangs, mice and insects. There should be kept water, mortar and separate places should be assigned for bathing, cooking, urination and defecation. It should suit the season of the year. The beddings, seats and covers should be comfortable and suitable to the season. Auspicious ceremonies should be performed in that room such as *homa*, expiations and presents to gods, for the proper protection of the child, and there should be present pious old men, doctors, and devoted

¹ प्राक् चैवासा नवमान्मासात् सुतिकागारं कारयेदपहतास्थिशर्कराकपालदेशं प्रशस्तरूपरसगन्धाय भूमौ प्राग्द्वारमुदग्द्वार वा । तत्र वैश्वाना काष्ठाना तिन्दुकैर्द्वादना भस्मातकाना वारुणाना खदिराना वा यानि चानान्यपि ब्राह्मणा शशेयुरथर्ववेदविदस्तद्वसनालेपनाकादनापिधानसम्पदुपेत तत् । वास्तु-विद्या हृदययोगेनाग्निसलिलोलुखलवर्ध-स्थानस्नानभूमिमहानसमृतसुखं च । तत्र सर्पिकैलमधुसैन्धवसौवर्षलकाललवणविडङ्गगुडकुष्ठकिलिममागरपिप्पलीमूलहस्तिपिप्पलीमण्डूकपर्णैरालालाङ्गलीवचाचन्यचित्रकचिरविस्व-हिङ्गुसर्प लघुनक्तनक्तिकानीपातसौवर्षलजम्बूकुलल्यमैरेयसुरासवा समिहिता मृ ॥ यथास्मान्नीहौ हे चण्डमूषले हे छलूखले खरो वृषभश्च हौ च तीक्ष्णौ सूचीपिप्पलकी सोवर्णराजतौ हे शस्त्राणि च तीक्ष्णायसानि हौ च विस्वमयो पर्यङ्गौ तैन्दुकैर्द्वादानि काष्ठन्यग्निस्नुचणानि स्त्रियश्च वङ्गो बहुश्रप्रजाता सौहार्दयुक्ता सततमनुरक्ता प्रदक्षिणाचारा प्रतिपत्तिकुशला प्रहसित्सलास्यक्तविषादा क्लेशशङ्खिण्वीऽभिमत ब्राह्मणशायर्व्वेदविदो यज्ञान्यदपि तत्र समर्थ मन्येत यश्च ब्राह्मणा ब्रूयु स्त्रियश्च वृक्षास्तत्कार्यम् ॥

attendants constantly The child's bed, covers and sheets should be soft, light, pure and scented These should always be free from sweat, dirt, worms or bugs, urine and faeces If repeated change of new clothes be impossible, the soiled coverings should be well washed and the beddings well purified with steam and thoroughly dried before they are used again. To purify or sterilise the dress, beddings, coverings and sheets by fumigation use the following medicines with clarified butter —Barley (*Hordeum Vulgare*), mustard seeds, linseeds, asafoetida, Guggula (*Balsamodendron Mukul*), Vāca (*Acorus Ciliatus*), Coraka (*Andropogon Acicularis*), Vayasthā (*Chebulic Myrobolan*), Golomī (*Panicum Dactylon*), Jatilā (*Nardostachys Jatumansi*), Palankasā (a variety of Guggula), Aśoka (*Saraca Indica*), Rohini (*Picrorhiza Kurroa*) and sankes' skin A variety of toys to please the child should be at hand and these should be coloured, light, musical, beautiful and must not be sharp pointed They should be of such a size and shape as cannot be put into the child's mouth or do not terrify or kill the child¹

[illegible]

Suśruta directs that there should be a particular room provided for patients who have undergone surgical operations.¹ "Patients suffering from surgical diseases as inflammatory swelling, wounds &c should, from the very commencement of their illness, confine themselves inside a clean house, situated in a wholesome locality, free from draughts and not exposed to the glare of the sun. For, in such a building, constitutional, mental and accidental diseases are not likely to occur. In that room, the bed for the patients should be soft, spacious, and well-arranged. The patient should lie down, his

¹ ब्रणिन प्रथमसेवागारमन्विच्छेत्तन्नागारं प्रशस्तवास्तादिकं कार्यं ।

प्रशस्तवास्तुनिगृहे शुचावातपवर्जितं ।

निवाते न च रोगा सुः शरीरागन्तुमानसा ॥

तस्मिन् शयनमसम्बाध स्वास्तीर्णं मनीषा प्राक्शिरस्कं सगन्धं कुर्वीत ।

सुखचेष्टाप्रचारं सप्तात् स्वास्तीर्णं शयने ब्रवीत् ।

प्राच्या दिशि स्थिता देवास्तत्पूजार्थं नत शिरः ॥

तस्मिन् सुदृक्क्षिरशुक्ले प्रियम्बदेरुपास्यमानो यथेष्टमासीत् ।

सुदृढी विचिपत्प्रागु कथाभिर्नैववेदना ।

आशवासयन्ती बहुशस्तशुक्ला प्रियम्बदा ॥

न च दिवानिद्रावशगं सप्तात् ।

दिवास्वप्नाद्वृषे कण्डूर्गात्राणा गौरव तथा ।

श्रयधुर्व्वेदनारागं स्वावयैव भृशं भवेत् ॥

उत्थानसवेशनपरिवर्तनचक्रमणौर्ध्वाधोपदिपु चात्मचेष्टास्वप्नमत्तीं ब्रणं सरजेत् ।

स्थानासन चक्रमणं यानयानातिभाषणं ।

ब्रणवान्न निषेवेत शक्तिमानपि मानवः ॥

उत्थाभायासनं स्थानं शय्यां चातिनिषेविता ।

प्राप्तुयान्मारुतादङ्गे रुजस्तस्माद्विवर्जयेत् ॥

शय्याणाञ्च स्त्रीणां सन्दर्शनं ससम्भाषणं सम्पर्शनानि दूरतः परिहरेत् ।

head pointing towards the east, and keep there some weapon for his own protection. On such a bed, the patient can be comfortably and turn to his sides at pleasure. He should be surrounded by his dear friends, for their sweet words relieve the pain of inflammation. The female friends, however, should be avoided and kept at a distance. He should observe strictly the orders of the surgeon as regards his food, drink and mode of living. He should have his hairs clipped and nails pared short, be pure in his person, put on white clothes and devote himself to religious duties. A light should be kept burning and garlands of flower, weapons &c, should be provided in the room to ward off the demons. He should be cheered and inspired by pleasant stories and the physicians and the priests should attend the patient morning and evening. Pastils made of *Smopsis Nigra* and *Azadirachta Indica* with clarified butter and salt, should be burnt in the room morning and evening for ten days continually. The inflamed part should be fanned with a *cāmar* or yolk-tail. Sleep during the day, exercise and sexual intercourse must on no account be indulged in."

Saṁsṛta also describes the kitchen of the King thus —
That is the proper kitchen which is built on good ground
towards an auspicious quarter, full of utensils for cooking,
spacious, clean, provided with windows guarded by a net, not
frequented by friends, cleaned well of flies, furnished
with a canopy purified by auspicious ceremonies, and
managed by men and women of good character. The superior
cook of the kitchen should be the chief of the kitchen
various. The cool and servants should be of good character,
and good looking, engaged on their duty, and
the women should be of good character, and good looking.

well-bathed, of subdued passion, well-dressed, obedient and have their heads well-covered "

"The doctor in charge of the kitchen should be of noble family, religious, friendly, a clever manager for getting king's food properly prepared, ever careful for his health, non-avaricious, simple, fond, grateful, good-looking, cool-tempered, well-behaved, not proud and envious, laborious, of subdued passion, forgiving, pure, of good character, kind, intelligent, not easily fatigued, always loving, well wisher, capable, bold, clever, skillful, not unreasonably tender, provided with medicines and well proficient in the art of healing "1

1

कुर्वान् धार्मिकं सिद्धं सुभक्तं सततोत्थितम् ।
 अलम्ब्य अशठं भक्तं कृतघ्नं प्रियदर्शनम् ॥
 क्रीडपारुष्यमात्सर्यं मदालस्यं विषर्जितम् ।
 जितेन्द्रियं क्षमायुक्तं गुचिं शीलदयान्वितम् ॥
 मेधाविनमसत्रयान्तमनुरक्तं हितैषिणम् ।
 पटुं प्रगल्भं निपुणं दक्षं मायाविवर्जितम् ॥
 पूर्वोक्तैश्च गुणैर्युक्तं नित्यं सन्निहितागदम् ।
 महानसे प्रयुञ्जीत वेद्यं तद्विद्यपूजितम् ॥
 प्रशस्तदिग्दृशकृतं गुचिभाण्डं सहस्रगुचिम् ।
 सज्जालकं गवाक्षाट्यं साम्प्रवर्गं निषेवितम् ॥
 विकचसृष्टसृष्टं सवितानं कृतार्चनम् ।
 परीक्षितं स्त्रीपुरुषं भवेशापि महानसम् ॥
 तत्राध्यक्षं नियुञ्जीत प्रायश्चित्तं वेद्यगुणान्वितम् ।
 गुचयो दक्षिणा दक्षा विनीताः प्रियदर्शनाः ॥
 सविभक्ता सुमनसो नीचं केशनखा मथिराः ।
 स्रातादृष्टं सयमिनः कृतीणीषा सुसयुताः ॥
 तस्याचाज्ञा विधेयासुरा विविधा परिकर्म्मिणः ।
 आहारस्थितं यथापि भवन्ति प्राणिनी यतः ॥
 तप्मान्महानसे वेद्यं प्रसादं रहितो भवेत् ।
 माहानसिकं वीटारं सीपीदनिकं पीपिका ॥
 भवेयुर्वैद्यवशगा ये चाप्यन्ये तु केष्वन ।
 इह तद्धो मनुष्याणां वाक्चेष्टमुखवेकते ॥

In the Kāmandakiya Nitisūtra, we find the king advised to take thoroughly examined food, and to be surrounded by physicians well-versed in the science of Toxicology.¹ and again it is said that king should take his medicines, cordials, and edibles after having his medical attendants tasted them - The king is advised to kill his enemy by weaning over his physician or by administering poisonous liquids.²

In the Mahāvāgga⁴ we find the qualities of a good patient and a good nurse described —

“6 What are five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon—

When he does do what is good for him, when he does know the limit (of the quantity of the food) that is good for him, when he does take his medicine, when he does let a nurse who desires his good, know what manner of disease he has, or when he is getting worse that that is so, or when it is getting better that that is so, and when he has become able to bear bodily pains that are severe, sharp, grievous, disagreeable, unpleasant and destructive to life. These are the five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon.

¹ विषप्रैरुदकं खात. विषघ्नमभिभूयित ।

परीक्षितं समशीयाञ्चाहुस्त्राविद्विषहत ॥ १० ॥

Kāmandakiya Nitisūtra vii v 10.

आयधानि च सर्वाणि पान पानीयमेव च ।

तत्कम्पके. समाखाय प्राशीयाद्भिजनानि च ॥ २० ॥

Itol vii v 27

² भिषग्भिदेन वा शत्रु रसदानेन साध्यदेत् ॥ ३० ॥

Itol. ix v 70

⁴ Mahāvāgga vii, 68 8 (Sacred Books of the East)

8. There are five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task—when he is capable of prescribing medicines, when he does know what (diet) is good and what is not good for the patient, serving what is good and not serving what is not good for him, when he does wait upon the sick out of love, and not out of greed, when he does not revolt from removing evacuation, saliva or vomit, when he is capable of teaching, inciting, arousing and gladdening the patient with religious discourses. These are the five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task.”

There is also good deal of evidence to show that medicines were distributed free to the poor and to the pious men. When Visakhā asked for eight boons of the Buddha, she mentioned amongst them the privilege of bestowing her life long “food for the sick, food for those who wait upon the sick and medicines for the sick” and explained her reasons as follows¹ —

“9 Moreover, Lord, if a sick Bhikkhu does not obtain suitable foods, his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the diet that I shall have provided for the sick neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the Saṃgha my life long with diet for the sick

Moreover, Lord, a Bhikkhu who is waiting upon the sick if he has to seek out food for himself, may bring in the food (to the invalid) when the sun is already far on his course, and he will lose the opportunity of taking his food. But when

he has partaken of the food I shall have provided for those who wait upon the sick he will bring in food to the invalid in due time and he will not lose the opportunity of taking his food. It was this circumstance, Lord, that I had in view in desiring to provide the Sangha my life long with food for those who wait upon the sick.

10 Moreover, Lord if a sick Bhikkhu does not obtain suitable medicines his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the medicines which I shall have provided for the sick, neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the Sangha my life long with medicines for the sick."

The Edict No II of Asoka clearly shows that charitable institutions were common in India, during his reign. The Edict runs as follows —

'Everywhere in the kingdom of the king Piyadasi, beloved of the gods, and also of the nations who live in the frontiers such as the Cholas, the Pandyas, the realms of Satyaputra and Kerdiputra, as far as Tambaparni (and in the kingdom of) Antiochus, king of the Greeks and of the kings who are his neighbours, everywhere the king Piyadasi, beloved of the gods has provided medicines of two sorts, medicines for men and medicines for animals. Wherever plants useful either for men or for animals were wanting they have been imported and planted. Wherever roots and fruits were wanting they have been imported and planted. And along public roads which are to be used for the use of animals and men.'

As collected from Hsuen Tsang's account, the Śālistambī II

(610 - 650 A D) was inclined towards Buddhism and he forbade the slaughter of living animals, built *stupas*, and "in all the highways of the towns and villages throughout India, he erected hospices, provided with food and drink, and stationed there physicians with medicines for travellers and poor persons round about, to be given without any stint"¹

He also mentions about the father of the Bhikkhu Śrutavimsatikoti, that "from his house to the snowy mountains, he had established a succession of rest-houses, from which his servants continually went from one to the other. Whatever valuable medicines were wanted, they communicated the same to each other in order, and so procured them without loss of time, so rich was this family"-

He also mentions charitable institutions called *Punyaśālās* as common in India. "There were formerly in this country (Tsch-kin-Takka) many houses of charity (goodness or happiness, *Punyaśālās*) for keeping the poor and the unfortunate. They provided for them medicines and food, clothing and necessities, so that travellers were never badly off"²

Again he says "Benevolent kings have founded here (Mo-ti-pil-lo or Matipura) a house of "merit" (*Punyaśālās*). This foundation is endowed with funds for providing choice food and medicines to bestow in charity on widows and bereaved persons, on orphans and the destitute"³. A similar *Punyaśālā* or hospice was in K'ei-P'an-to (Kabandha)⁴. In describing

¹ Beal's Record, Vol I, p 214.

² *Ibid*, Vol. II, p 188

³ *Ibid*, Vol. I, p 165

⁴ *Ibid*, Vol I, p 198

⁵ *Ibid*, Vol. II, p 303

for pregnant women, and for the blind and diseased¹ Dhatushena builds Hospitals for cripples and sick². Buddha Das³ himself ordained a physician for every ten villages on the high road, and built asylums for the crippled, deformed and destitute"⁴

The animal Hospitals or Pūjṛāpoles which still exist at Ahmedabad, Surat, and Sodepore in Bengal, and elsewhere may be regarded as the survivals of the institutions founded by the Maurya monarch. The following account of the Surat Hospital in the 18th century is from the pen of Hamilton —

"The most remarkable institution in Surat is the Banyan Hospital, of which we have no description more recent than 1780. It then consisted of a large piece of ground enclosed by high walls, and sub-divided into several courts or yards for the accommodation of animals. In sickness they were attended with the greatest care, and here found a peaceful asylum for the infirmities of old age.

"When an animal broke a limb, or was otherwise disabled, his owner brought him to the Hospital, when he was received without regard to the caste or nation of his master. In 1772 this hospital contained horse, mules, oxen, sheep, goats, monkeys, poultry, pigeons, and variety of birds, and also an aged tortoise, which was known to have been there seventy-five years. The most extraordinary ward was that appropriated for rats, mice, bugs, and other noxious vermins for whom suitable food was provided"⁵

¹ Mahāwanśo, p. 249

² *Ibid.*, p. 245

³ *Ibid.*, p. 256

⁴ Cunningham's *Bhilsa Topes*, p. 54, foot note

⁵ Hamilton's *Description of Hindustan* (120) Vol. I, p. 718, quarto ed., Crooke *Things Indian*, Art. Pūjṛāpole, (Murray 1906)

We quote here from Hemādri the opener of the *Āyurveda* and the Purāṇas as to the merit of the founder of a Dispensary —

Visvamitra

There is no gift more precious than the gift of cure, therefore it should be given freely to the sick to augment one's good fortune. He who gives medicines, diet, food and comfort, rest and shelter to the sick, becomes free from all disease.

Samvartha.

The giver of medicine, obnoxious remedy and relief to the cure of the sick, becomes free from all disease, happy and long-lived.

Agastya.

Those who give rice and medicine freely are happy, being free from disease.

Saura Purāṇa

He, who gives medicines to the sick, cures them and always remain healthy, long-lived and happy.

१ अथ आरोग्यदानं ।

आरोग्य दानं च ॥ १ ॥

आरोग्य दानं च ॥

आरोग्य दानं च ॥ १ ॥

आरोग्य दानं च ॥ १ ॥

आरोग्य दानं च ॥ १ ॥

आरोग्य दानं च ॥ १ ॥

मन्त्रः ।

ॐ नमो भगवते वासुदेवाय ॥

ॐ नमो भगवते वासुदेवाय ॥

Nandi Purāna

The high-souled man who gives the Brahmins collyrium in charity to cure the diseases of the eye, goes to the Sun (after death) and becomes free from eye diseases, fine-looking and fortunate

Good health is a step to the acquirement of religious merit, wealth, pleasure and final emancipation, and so the man who bestows cure to the sick and also he who erects a hospital equipped with good medicaments, dresses, learned doctors, servants and rooms for students, always gain them. The doctor should be well-versed in the religious treatises, experienced, familiar with the actions of medicines, a discriminator of the colour of the roots of the herbals and well-acquainted with the

अगस्त्यः ।

अग्नी पद्मप्रदातारः सुखं याति निरामया ।

सौर पुराणे ।

रोगिणी रोगशान्त्यर्थमीषधं यः प्रयच्छति ।

रोगहीनः स दीर्घायुः सुखी भवति सर्व्वदा ॥

नन्दि पुराणे ।

अज्ञानं यो नरोदयादक्षीर्णमधिगच्छति ।

विप्राय स पुमान् याति सूर्य्यलोकं मष्टमतिः ।

आरोग्यनयनी दिव्यः सुभगो जायते नरः ॥

तस्मिन्नेव पुराणे ।

धर्मार्थकाममोक्षाणां आरोग्यं साधनैर्युतम् ।

अतस्त्वारोग्यदानेन नरो भवति सर्व्वदा ॥

आरोग्यशालां कुरुते महीपद्मपरिच्छदा ।

विदग्धवेद्यसयुक्तां सत्यावसथसयुतां ॥

proper season of raising them from the ground, well-trained with the qualities of the juices, (then strength and actions), sālī rice, meat and medicaments, trained in compounding medicines, one who knows well of the physique of men by intelligence, one who knows the temperament and the qualities of the diet, a pathologist who is not idle, well acquainted with the remedial agents for the premonitory signs and sequelæ of diseases, proficient in the requirements of time and place, well-read in the medical text-books—the Ayurveda with its eight divisions and an expert in curing diseases by domestic remedies (prepared from handful of common ingredients)

The pious man who erects such a hospital in which the services of good physicians of this nature are retained, becomes celebrated as the virtuous, the successful and the intelligent

वैद्यस्तु शास्त्रवित् प्राज्ञी दृष्टौपधपराक्रम ।
 औपधोमूलवर्णज्ञः समुद्धरणकालवित् ॥
 रसवीर्यविपाकज्ञः शालिमांसौपधीगणे ।
 योगविद्देहिनां देह यो धिया प्रविशेद्बुध ॥
 धातुपथ्यमयज्ञश्च निदानविदतन्द्रित ।
 व्याधीनां पूर्वलिङ्गज्ञस्तदुत्तरविधानवित् ॥
 देशकालविधानश्रयिक्त्वाशास्त्रवित्तथा ।
 अष्टाङ्गायुर्वेदवेत्ता मुष्टियोगविधानवित् ॥

अष्टावङ्गानि आयुर्वेदस्य ।

यथाशल्य शलाक्यं कायचिकित्सा भूतविद्या कौमारभृत्यमगदतन्त्रं रसायणतन्त्रं वाज्जीकरणतन्त्रमिति सुश्रुतीक्तानि ।

एव विधः शुभी वैद्यो भवेद्यत्राभियोजितः ।
 आरोग्यशालामवन्तु कुर्याद्वीधर्मसमर्थः ॥
 स पुमान् धार्मिको लोके स कृतार्थः सुवृद्धिमान् ।
 सम्यगारोग्यशालायामोपधेः स्नेहपाचने ॥

man in this world. If in such a hospital the kind-hearted man can cure a single patient of his maladies by simple medicines, oleaginous remedies and compounds of medicinal decoctions, goes to the Brahman's residence with his seven generations upwards. The rich and the poor acquire religious merit in proportion to the amount of riches they possess, where would the poor man get a hospital and a young physician to cure his diseases? The man secures the eternal regions mentioned before by rendering the sick healthy by the use of roots to some and by good rubbing (with external applications) to others. He who cures the sick suffering from an increase or decrease of the Air, the Bile and the Phlegm by simple remedies, he too goes to such blessed regions (after death) as are secured by those who perform many religious sacrifices (Yajñas).

व्याधिर्न विरुन्धी कृत्य अप्येकं कुरुष्यायुतः ।
 प्रयाति ब्रह्मसदनं कुलसप्तकसयुतः ॥
 आग्नी विष्णुसारेण दरिद्रः फलभाग् भवेत् ।
 दरिद्रस्य कुतः शाला आरोग्याय भिषग्युवा ॥
 अपिमुनिन किनापि मर्दनाद्यैरपि वा ।
 स्वस्थीकृतं भवेन्मर्त्तं पृथ्वीर्लोकमव्ययं ॥
 वात पित्त-कफाद्यानां चया पचयभेदिना ।
 यन्तु स्वस्थाभ्युपायेन मोचयेत् व्याधिपीडितान् ॥
 सीपि याति गमान् लोकान् श्रवाण्यान् यज्ञयाजिभिः ।

स्कन्दपुराणे ।

आरोग्य शालां यः कुर्यात् महावैद्यपुरस्कृता ।
 सर्वोपकरणोपेता तस्य पुण्यफलं शृणु ॥
 धर्मा धर्म-काम-मोक्षाणामारोग्य साधनं यतः ।
 तस्मादारोग्य दानेन तद्दत्तं स्यात्तुष्टयं ॥
 अथैकमार्त्तं विद्वांस स्वस्थीकृत्य प्रयत्नतः ।
 प्राप्नोति सुमहत्पुण्यमनन्तं चयवर्जितं ॥
 ज्ञानयोगरतं शान्तं रोगार्त्तं शिवयोगिनः ।
 यः स्वस्थं कुरुते सीपि सर्वदानफलं लभेत् ॥

Skandapurāṇa.

Hear, the amount of religious merit secured by a man who erects a hospital containing all the necessary articles (of treatment) and in which are engaged eminent physicians by reward. As good health is the means of attaining religious merit, wealth, pleasure and final emancipation, therefore, he by rendering the sick healthy, gives these four blessings

By carefully curing a learned man of his sickness great merit is secured, which is eternal and indestructible. He too who cures a sickman who is calm and absorbed in meditation of Siva and knowledge, attains the virtue of all kinds of gifts. Brahṃā, Viṣṇu, all the gods, diseases, relatives and kings—they are obstacles to yoga but not to those who perform it (yogi). Whatever merit is obtained by the great, by supporting the sick Brāhmans (priests), Kṣhatryas (warriors), and Bīṣṭh (cultivators) and Sudras (servants), can not be obtained by the performance of all the great Yajñas (religious ceremonies). As even the gods can not reach the end of the

ब्रह्मा विष्णु, सुराः सर्वे व्याधयः स्वनना नृपाः ।

योगस्थै मद्भाविभ्या व्याधयस्ते न योगिनां * ॥

ब्रह्म-चन्द्रिय-विद्व-शूद्रान् रोगार्तान् परिपाल्य च ।

• यत्पुण्यं महदाप्नोति न तत्सर्वमहामखै' ॥

आकाशस्य यथा नान्तं सुरैरप्युपलभ्यते ।

तद्वदारीग्यदानस्य नान्तीवै विद्यते क्वचित् ॥

मुख्येनानेन महता गत्वा शिवपुरं नर ।

सीदते विविधैर्भोगैर्विमानैः सर्वकामिकै' ।

एकविंशत्कुलीपेतं सम्भृत्य परिपालित' ।

आसीत् शिवपुरे तावदावदाह्वयसप्रवं ॥

तत' स्वधर्मशेषेण संप्राप्तं प्रयतः सदा ।

ज्ञानमुत्पद्यते तस्य रुद्रेभ्यः परिचारकः ॥

* स्वेन योगिनामिति वा पाठः ।

firmament, so there is no end (to the merit) of the gift of cure. By this great merit, the man reaching the region of Siva enjoys himself by sojourning in a balloon which can go to the various desired directions. With his twenty-one generations upwards and surrounded by his servants, he stays in the Siva's realm so long till deluge does not occur. There, after the lapse of his merit, the devoted servant acquires knowledge from Siva.

Abandoning this world by knowledge, abiding by the prayers to Siva, and casting away this body as a straw, he reaches beyond the limits of sorrow. Being freed from all sorrows, becoming pure, all-knowing and self-sufficient, and absorbed in his ownself, they are called the Liberated. Therefore to mitigate the diseases, the sick should be well nursed, the great sages should especially be attended to even by the sacrifice of one's body or riches. The wise must not irritate the weak patients, and they like the preceptors should be rescued constantly from sins. He who relieves the sick, by taking them under his care, reaches the other bank of this ocean of world.

आमादिरक्त ससाराष्ट्विध्यानमुपाश्रित ।
 स्वदेहं तणवत्प्राप्ता सर्वदुःखान्तमाप्नुयात् ॥
 समस्तदुःखनिर्मुक्तं शुद्धं स्वात्मयवस्थित ।
 सर्वत्र परिपूर्णं मुक्त इत्यभिधीयते ॥
 तस्माद्दोषापवर्गार्थं रोगार्त्तं समुपाचरेत् ।
 विज्ञेयेषु तु योगीन्द्र शरीरेण घनेन च ॥
 रोगिणी नीद्विजेत् प्राणी दुर्बलानपि सर्वदा ।
 तान् पापाद्दुःखत्रित्यमेवन्मर्माः प्रवर्त्तते ॥
 यो न गृह्णीतमात्मानं मन्यमानो दिने दिने ।
 उपसर्पेत् रोगार्त्तस्तीर्णस्तेन भवार्णव ॥

इत्यारोग्यदानं ।

Hemādri's Catuvarga, Cintāmoni, Dāna Khandaṁ
 Asiatic Soc Ed Ch XIII P 891—95

After these proofs, the statement of Mr Amcei Ali that "the Arabs invented chemical pharmacy, and were the founders of those institutions which are now called dispensaries" can not be accepted as correct.

DISPENSARIES

As regards dispensaries, Susruta advises the physician to construct his dispensary in a clean locality, and the building should face towards some auspicious direction as the east or the north. He says — "The medicines should be kept in burnt earthen pots arranged on planks supported by stakes or pins" — This is still the method of storing medicines used by the *Kannāras*. Dallyana explains the passage thus — "The medicines should be kept in pieces of cloth, earthen pots, wooden pots and Śunka (kilaka)" — The former explanation is plausible for it is impossible to imagine how a kilaka or stake can be a container of medicine, unless it is implied as a point of support for hanging the medicine vials from it.

Dr Heyne (1814) thus describes the ancient dispensaries of the Hindus. "The place in which medicines are kept should

¹ History of the Saracens p. 262, 1899

" शीतम्हाण्डफलकशङ्खुविन्यस्तभेषज
प्रशस्तायां दिशि शुची भेषजागारमिष्यते ॥

Susruta Samhitā I 222vii.

² गृहीतोपधसम्यापनोपाय दर्शयन्नाह,—शीतेति । शीत कर्पटखण्डं, रुदा भाण्ड, रुतभाण्ड । फलक पट्टक इति पुस्तकान्तरे पाठः, शङ्खुः कीलक, एतेषु शीतादिषु विन्यस्त धृत भेषज यस्मिन् गृहे तत् भेषजागारं भेषजगृहमिष्यते इति सम्बन्धः । प्रशस्तायां दिशि पूर्वस्यामुत्तरस्यां वा, शुची देशे अग्निन् भूमिप्रविभागीयाध्याये, निवस्येषु ध्यत्ययेन न पाठी दृश्यते । अग्राभिस्तु हज्रक्रमरीत्येव पाठी लिखित इति सर्वावयवसाध्वित्यादि यावन्नव द्रव्यं पुराणमेति पाठ केचिदाचार्या न पठन्ति ॥

be clean, dry, and not accessible to rats, white ants or dust. The drugs ought to be put in nets, or large pots, the mouth of which must be tied over with a piece of cloth, and suspended in a room. Fire, smoke and water must be kept at a distance.

The house in which medicines are stored, should be neither in too high nor too low a situation, and it should not be far distant from places in which medicines may be collected. Its front should face either the south or the north, with a convenient *mandu* before the door of the same side.

The necessary apparatus for mortars, scales, &c. must be kept in a place in the wall that has been consecrated for that purpose by religious ceremonies."

After describing the different classes, and members composing each class, of medicines, Suśruta continues "The wise physician should collect and classify these medicines, and with them prepare external applications, infusions, oils, ghee, syrups, &c., as required for derangement of a particular humour. The medicines should be carefully preserved in all seasons, in rooms free from smoke, rain, wind and dust. The medicines should be used singly, or in combinations of several medicines of a class, or of an entire group, or of more than one group, according to the nature of the disease, and the extent of derangement of the humours"¹

¹ एभिर्लेपान् कषयाश्च तेल सर्पि पिपानकान् ।
 प्रविभज्य यथान्याय कुर्वीत सतिमान् भिषक् ॥
 घूमवर्षानिलक्षेदेः सर्वर्चुष्वनभिद्रुते ।
 यादयित्वा गृहे न्ययेद्विधिनोपधसयह ॥
 समीक्ष्य दीपभेदाश्च गणान् भिन्नान् प्रयोजयेत् ।
 पृथग्भिन्नाण् समस्तान् वा गण वा व्यस्तसहते ॥

ANÆSTHETICS.

In the medical text books of the Hindus, there is no mention of a general anæsthetic, from which we can infer that it was unknown in those ancient days. There are, however, many indications to show that the earlier surgeons felt the necessity of such an agent to produce insensibility to pain. Both Caraka and Suśruta mention the use of wine to produce the desired effect. Caraka says: "After extraction of a dead fetus before the full term of pregnancy, wine should be prescribed to her, for that will improve the condition of her uterus, make her happy and alleviate the pain of the operation."¹ Suśruta, however, distinctly lays down that "wine should be used before operation to produce insensibility to pain." He again remarks: "It is desirable that the patient should be fed before being operated on. Those who are addicted to drink and those who cannot bear pain, should be made to drink some strong beverage. The patient, who has been fed, does not faint, and he who is rendered intoxicated, does not feel the pain of the operation."

The use of certain drugs to produce anæsthetic effects was well known to the ancient Greeks and Romans. Dioscorides

¹ व्यपगतगर्भस्यान्तं स्त्रियमासगर्भां सुरार्शाध्वनष्टिमधुमदिरासवानामन्यतममये
सामश्रुतः प्राययेत् गर्भकोष्ठविगुह्यार्थमर्त्तिविस्मरणार्थं प्रहृष्टपणार्थं च ॥

Caraka Samhitā, IV, viii

- प्राक्शस्त्रकर्माण्येष्ट भोजयेदातुर भिषक् ।
मदाप प्राययेन्मद्य तीक्ष्ण योऽवेदनासह ॥
न मूर्च्छत्यन्नसयीगान्मत्त, शस्त्रं न युज्यते ।
तस्मादवश्यं भोज्य रोगिपूत्तेषु कम्भनि ॥
प्राणी ह्याभ्यन्तरो नृणां वायुप्राणगुणान्वितः ।
धारयत्यविरोधेन शरीरं पाञ्चभौतिकं ॥

Suśruta Samhitā, I, viii

mentions Mandiagora (Mandiagora Atropa) to have been employed internally as a hypnotic and anæsthetic Pliny (32-79 A D) in his Natural History mentions that this anæsthetic was also used by inhalation, and this fact is corroborated by Galen, Aretæus, Celsus and others. The Arabian physicians also used it. The Chinese surgeons still use some powder (Indian hemp probably) to throw their patients into profound sleep. In the 13th century Theodoric (died 1298) described the "spongio somnifera" the vapours raised from which were capable, when inhaled, of setting patients into an anæsthetic sleep, thus inducing insensibility to the agony and torture of a surgeon's knife. Baptista also mentions his "Pomum somniferum", to be made with mandiagora, opium, &c. The Hindus also inhaled the fumes of burning Indian hemp as an anæsthetic at a period of great antiquity. As early as 927, A D, they also knew drugs which they employed for the same purpose, for Pandit Vallāla, in his Bhoja Prabandha, alludes to a cranial operation performed on the King Bhoja after he was rendered insensible by some drug called Sammohini (producer of unconsciousness). Another drug is also mentioned, Sañjibani (restorer to life), by which he soon regained consciousness after the operation had been finished.¹

¹ ततस्तावपि राजानं मोहयित्वा शिरः कपालमादाय ततः करोटिकागुटे स्थितं शफरकुलं गृहीत्वा कथिच्छिन्नाजने निक्षिप्य सम्भानकरणया कपालं यथावदारचय्य सञ्जीवनाग्रं च तं जीवयित्वा तस्मै तद्दर्शयताम् ।

CHAPTER III

MATERIALS OF INSTRUMENTS

IRON AND STEEL

In the Rgveda, *ayas*, (Latin *aes*), next to gold, is the metal most often referred to. *Ayas* often stands as a generic name to mean simply "metal," though in later works it signifies iron as a rule. The mention of dark and red *ayas* in the Atharvaveda indicates a distinction between iron and copper or bronze. The surgical instruments of the Hindus are recommended generally to be made of iron, but Sushruta allows other suitable material when iron of good quality is not available¹. He says "A wise surgeon should get the instruments made of pure iron and with sharp edges by an expert blacksmith who is skilful and experienced in his craft". The use of impure iron as a material for surgical instruments, he deprecates as a defect and advises the surgeons not to rely on such instruments.

The Hindus were acquainted with steel and they know how to turn out steel of fine quality from a pure iron ore. Nāgārjuna, the well known Buddhist chemist, wrote a scientific

¹ तानि प्रायशी र्नीहानि भवन्ति तत्प्रतिरूपकाणि वा तद्वत्वाग्ने ।

Sushruta Samhita, I vii

² शस्त्राख्येतानि सतिमान् शुद्धैश्चायसानि तु ।

कारयेत् करणैः प्राप्तं कर्णारं कर्णकोविदः ॥

Ibid, I viii,

treatise on steel and iron.¹ Śibodāsa in his commentary on Chakrapāṇi quotes Patanjali as an authority on the subject.² In the Dharmaveda, Vācintāmaṇi, Śūtaṅgulharapaddhati and Lohārṇava, steel as a material of sword has been described and classified.

Dr Mitra quotes some references³ about the knowledge of iron possessed by the ancient Hindus from the Rgveda. He finds that "swords (II 156), spears (IV 25) javelins (II 292), lances (I 774), (IV II 288) and hatchets (I 120) are frequently mentioned, and these weapons were bright as "gold" or golden (IV 19), "shining bright" (I 175), "blazing" (IV 93), "sharp" (IV 113) and "made of iron" (I 226), they are "whetted on a grind stone" (II 36) to improve their keenness (I 150), and "polished to enhance their brightness" (II 326). "According to Nearchus King Porus gave 30 lbs of steel to Alexander as the most precious present he could offer."

Royle also remarks⁴ "Working in metals they have long been famous for their steel acquired so great celebrity at an

¹ नागार्जुनी मुनीन्द्र शशास यज्ञीरशास्त्रमतिगहनम् ।

तस्यायस्य षट्पदे वयमेतदिगदाचरैर्हूमः ॥

Cakradatta, Rasīyanādhikāra

² अर्चयिता विधानेन रंरम् गुरुभास्करो ।

लोकपालान् यथाशेषेन चेतपालानर्थोपधम् ।

आदित्यदेवताग्रेक्ष धन्वन्तरी पतञ्जली

दद्यादखि सव्वैभ्यो नानाभचीपचारतः ॥

Quoted in Śibodas's commentary on Louhamāraṇa

Vidhi in Cakradatta

³ Dr R L Mitra's Indo Arians, Vol 1, P 301 See Wilson's Rgveda.

⁴ Royle's Antiquity of Hindoo Medicine. Pp 46 7,

early period, as to have passed into a proverb among the Persians, where *fouladee hand* indicates steel of the best quality, and *juwabee hand*, an Indian answer, means a cut with a sword made of Indian steel "

COPPER

Pure copper was also used as a material of instruments, and vessels and instruments of copper are frequently mentioned in the medical books of the Hindus. A copper probe for applying antimony to the eye has been found in the excavations of Bijnor and another in the Bihat excavations. Cakradatta¹ advises us to use a copper probe for the application of *lekhana* collyrium, and Suśruta mentions a copper needle in the operation for resection of cataract.²

TIN

Tin was also used as a material of blunt instruments. Suśruta mentions plates of tin to surround a tumour and to protect the healthy parts, before the application of actual cautery.³ Such plates are recommended to be made of tin, or lead, or copper, or iron.

LEAD

Tubes of lead were used for purpose of fumigation. Probes made of lead were used for application of collyrium. The use

¹ प्रशस्ता लिखने तासी रोपने काललीहना ।

Cakradatta, Añjanadhikāra

² ताम्रायसी शतकौम्भी शलाका स्यादनिन्दिता ।

Suśruta Samhitā, VI xviii.

³ अस्यावशिष्टे कृमिभिः कृते च लिखिततीक्ष्णि विदधीत पश्चात् ।

यदल्पमूल तपुतामसीस पट्टे समावेध्य तदायसैर्वा ।

आराग्निशलाख्य सकृद्विदध्यात् प्राणाणहिसन भिषग्प्रसक्त ॥

Suśruta Samhitā, IV xviii.

of lead plates to surround tumours before application of actual cautery has been noted above

BELL-METAL

The use of bell-metal—an amalgam of zinc or tin and copper, 25 parts of the former with 75 parts of the latter,—as a material of probes for applying collarium, is mentioned by Suśruta¹

GOLD AND SILVER

Gold was known to the Hindus from the remote antiquity, and among the metals, it is the one most frequently mentioned in the Rgveda. Silver was perhaps unknown during the earlier Vedic age, from its name being not mentioned in the Rgveda. But no conclusion can safely be drawn from this argument². We find, however, gold, silver, and other precious

¹ सौवर्णं राजतं शार्ङ्गन्ताम वेदूष्यकांसजं

आयसानि च योन्यानि शलाकाश्च यथाक्रमेण ॥

Suśruta Samhitā, VI. xviii

² “निष्कं यीव”

Rgveda 5 Mandala 19 Sūkta.

“निष्केन सुवर्णेन अलङ्कृता यीवा” ।

Sāyana

अश्वं न हेम्यावान् ।

Ibid 4 Mandala 2 Sūkta

“सुवर्णं निर्मितं कक्ष्यावान् अश्वः” ।

Sāyana

“A horse with golden caparisons”—Wilson

³ “एनौ रयि” ।

Rgveda 5 Mandala 33 Sūkta

एनवर्णा अथैतवर्णा रयि धनः ।

Sāyana

“Query, if silver money be intended”—Wilson

stones mentioned as materials of instruments in the medical books. Gold and silver vessels and plates are often described in Sanskrit literature.¹ Susruta mentions the use of drinking cups made of gold, silver and precious stones.²

Caraka, amongst other things necessary for a lying-in-room, mentions two needles of gold and silver.³ To cut the navel-cord of the new-born child, he recommends a knife made of gold, or silver, or iron.⁴ In the Manusamhitā⁵ we find: "Before the section of the navel string, a ceremony is ordained on the birth of a male, he must be made while sacred texts are pronounced, to taste a little honey and clarified butter from a golden spoon." A golden needle is mentioned by

- १ सुवर्णरुप्यशस्त्राणि युक्ति रत्न सयानि च ।
कांश्चाय मास रेत्यानि ण्पुत्रीस सयानि च ।
निर्लपानि विग्रहानि किवलिन जलिन तु ॥

इति ब्राचे ।

- २ सौवर्णे राजते ताम्रे कांस्ये मयिमये तथा
पुष्पावतस भौमे वा सुगन्धि सन्निध पिवेत् ॥

Susruta Samhitā, I. xlv.

- ३ * * * तीक्ष्णा सूक्ष्मीपिप्पलकी सौवर्ण राजती चे शस्त्राणि च तीक्ष्णायसानि ।

Caraka Samhitā, IV. viii

- ४ नाभिवन्धनात् प्रभवति हित्वाष्टाङ्गुलमभिज्ञानं कृत्वा छेदनावकाशस्य हयोवन्तरथोः
शनेर्गृहीत्वा तीक्ष्णेन रज्ज्वराजसायसानां छेदनानामन्यतमेनोपधारेन छेदयेत् ॥

Ibid.

- ५ प्राङ् नाभिवर्धनात्पुत्री जातकर्म विधीयते ।
मन्त्रवग्राशन चास्य हिरण्यमधुसर्पिषाम् ॥

Manusamhitā, II. 29.

- ५ Manusamhitā (ch II V 29. Jones's trans.)

Suśruta for picking the bulb of Soma plant to extract its juice ¹ To cure trichiasis, Cakradatta mentions a needle cautery of gold ² For destroying the hair follicles, he advises us to pass the hot needle into them as soon as the eyelashes are removed by epilation In the Yogaratnākara, is mentioned a cautery of gold, to burn the fistulous track round the anus Sārngadhara mentions silver or coral pots for keeping medicated snuffs, ⁴ and gold and silver tubs for immersing patients in medicated lotions ⁵

HOINS

Horns of animals are mentioned as suction-apparatus For

¹ " " " सोमकन्दं सुवर्णसृष्ट्यादिविद्राघं पयोऽग्नीयात् सौवर्णं
पात्रेऽञ्जलिमात्रं " " "

Suśruta Samhitā, IV १११८

² प्रहृष्टान्तर्मुखं रोमं सहिष्णोरुद्धरच्छने ।
सन्दर्शनीद्वरेदृष्ट्या पञ्चरोमाणि बुद्धिमान् ।
रचन्नचि दहेत् पञ्च तप्तहेमशलाकया ।
पञ्चरोगे पुनरेव कदाचिद्रोमसम्भव ॥

Cakradatta Netraroga Cikitsā

³ अपानमार्गपिटिका दहेत् स्वर्णशलाकया ।
अग्निप्रतप्तया पथात् कुर्यादग्नित्रणक्रियाम् ॥

Yogaratanākara, p 347
(Anandāsram Series)

⁴ कीणमच्छिन्नधारश्च हेमतारादिशूक्तिभि ।
शुक्त्या वा पात्रे युक्त्या वा प्लातैर्वा नस्यमाचरेत् ॥

Sārngadhara Saṁgītaḥ, III viii

⁵ सौवर्णं शक्यत वापि तामसायसञ्चदारुज ।
वीर्यं तत्र कुर्वीतीच्छाये षष्ठं त्रिंशदङ्गुल ॥

Ibid, III ii

this purpose, the horn of a cow is recommended ¹ A probe made of horn is advised to be used for applying collyrium Suśruta mentions goat's horn to be used as a container of medicine ² He also recommends for this purpose vessels manufactured out of horn ³ Similarly Caraka advises us to keep medicines in the lamb's horn ⁴ Tubes of Vasti-yantia (clysters) are often described to be made of horn ⁵

BONE AND IVORY

Vāgbhata II describes the anguli-tāṇaka or finger-guard to be made either of wood or ivory ⁶

¹ “चूषणे”, विष पूयाद्या चूषण निमित्त शरीरेषु युज्यते यत्, “शृङ्ग” गवादि भव
शुषिरं शृङ्गं

Vāgbhatārtha Kaumudī, I १११

² चूर्णाञ्जनं कारयित्वा भाजने मेघशृङ्गे ॥
संस्थाप्योभयतः कालमञ्जयेत् सततं बुध ।

Suśruta Samhitā, VI ११८

वशे वा माहिषे शृङ्गे स्थापयेत् शोधितं रसम् ।

Rasendia Cintāmaṇi IX

³ एतच्चूर्णाञ्जनं श्रेष्ठं निहितं भाजने शुभे ।
दन्तस्फटिकवैदूर्यं शङ्खशैलासनोद्भवे ।
शातकुम्भेऽथ शङ्खं वा राजते वा सुसंस्कृते ॥

Suśruta Samhitā, VI ११९

⁴ सिद्धं शैलासने भाण्डे मेघशृङ्गे च संस्थितं ॥

Caraka Samhitā, VI ११८

⁵ विमुद्रासं त्रिखण्डाच्च घातुना काष्ठना तथा ।
षडङ्गुलीस्या गोपुच्छा नाडी यज्जग्रात् द्विहस्तिका ॥

Sārngadhara Samgraha, III ११

⁶ अङ्गुलिं बाणकं दान्तं वार्धं वा चतुरङ्गुलम् ।

Aṣṭāṅga Hrdaya I XXV,

WOOD

To apply vapour-bath, Śārngadhara mentions tubes made of wood or metal.¹ Wooden Tubes for injections were also used.-

STONE

Śārngadhara says "The collyrium probes should be made either of stone or metal".² For compounding medicines, stone *khal* or mortar and pestles are mentioned. A big stone slab with a muller is recommended to be used for grinding dry or fresh vegetable medicines. In extracting the Soma juice, two slabs of stone are mentioned in the R̥gveda.⁴

EXECUTION

The execution of the instruments is said to have been all that can be desired. Suśrūta says⁵ "They should be made just of the proper size with their ends rough or polished, they should be also strong, well-shaped and capable of a firm grasp." Again he continues "When an instrument (has been selected) of

¹ नेत्रानि धातुनान्याहुर्नल वशादिनान्यपि ॥

Śārngadhara Samgraha, III १८.

² नेत्र कार्यं सुवर्णादिधातुभिश्चवेणुभि ।
मलैर्दृष्टैर्विषाणायैः मणिभिर्या विधीयते ॥

Ibid, III १.

³ सुखयोः कुण्डिता श्लक्षा शलाकाष्ठाहुलीन्मिता ।
अस्मन्ना धातुना वा स्यात् कलायपरिमण्डला ॥

Ibid, III १८८

⁴ R̥gveda 10 Mandala, 76, 94 & 175 Sūktas

⁵ समाहितानि यन्त्राणि खरश्मसुखानि च ।
सुदृढानि सुरूपाणि सुग्रहाणि च कारयेत् ॥

Suśrūta Samhitā, I १११.

a fine make and with an edge keen enough to divide the hairs on the skin, and when it has been firmly grasped at the proper place, only then it should be used in any surgical operation"¹. And again "A wise surgeon will get his instruments made of good iron and with sharp edges, by a blacksmith who is skilful and experienced in his craft"². Vāgbhata also gives the same directions³.

ORNAMENTATION

In the absence of actual specimen, it is impossible to say whether there was any ornamentation on the surgical instruments of the Hindus. No ornamentation is described in the extant medical treatises. Only one instrument—Mucuti—is mentioned by Vāgbhata II as being ornamented with a ring⁴.

EDGES OF SHARP INSTRUMENTS

Suśruta says⁵ "The edges of instruments, used in incising

¹ यदा सुनिश्चितं रूपं रोमच्छेदि सुसंस्थितं ।

सुगृहीतं प्रमायेन तदा कर्मसु योजयेत् ॥

Ibid, I viii

² See foot note 2, P 61

³ पट्विंशति सुकर्मारंघटितानि यथाविधि ।

शस्त्राणि रोमवारीणि बाहुल्येनाङ्गुलानि पट् ॥

सुरूपानि सुधाराणि सुयराणि च कारयेत् ।

अकरालानि सुभ्रातमुतीष्णावार्त्ततेऽयसि ॥

समाहितसुखायाणि नीलाभोजश्चवीनि च ।

नामानुगतरूपाणि सदा सन्निहितानि च ॥

Astānga Hrdaya, I. xxv

⁴ मुचुटी सप्त दन्तजुर्मूले रुचकभूषणा ।

Ibid

⁵ तत्रधारा भेदनानां मासूरी । लेखनानामर्शमासूरी ।

व्यधनानां विस्त्रावणानाञ्च कैशिकी । छेदनानामर्द्धकैशिकीति ॥

Suśruta Samhitā, I viii,

(as of Viddhipatīa, Nakhaśāstra, &c) should be of the fineness of a masūra (Eryum Lens), of those used in scarifying (as Mandalāgria &c) of a half a masūra, of those used in puncturing (as Kuthānikū) and evacuating (as needles, kuśāpatīa, &c) of a haṇ, and those used in dividing (as Viddhipatīa), of half a haṇ” As to the Vachśa or hook and the Dantaśanku or tooth-scalers, the former should have a curved end and a fine point, while the latter should have an end shaped like the first leaf of bailey”¹

THE TEMPERING OF SHARP INSTRUMENTS

Suśruta remarks² that “the instruments are tempered in three ways,—by immersing the heated śastra in an alkaline solution, or water, or oil. Those tempered in an alkaline solution are used in dividing bones and in excising arrows and other foreign bodies. Those tempered in water are used in incising, dividing or clearing muscles, and those tempered in oil are used in puncturing veins and dividing nerves and tendons”

As the methods of tempering the śastras are the same as those recommended for the arms of war, we quote from Vṛddha Śāringadhara (the elder), two methods of tempering arrow-heads and swords. He says³ “I shall describe the ways of tempering arrow-heads, by smearing them with a paste of

¹ वस्त्रिशी दन्तशङ्खुयानताये तीक्ष्णकण्टकप्रथमं यवपत्रसुखे ।

Suśruta Samhitā, I viii

² तेषां पायना त्रिविधा चारीदकतेलेषु तत्र चारपायितं शरशल्याभ्यिच्छेदनेषु ।
उदकपायितम् मासच्छेदनभेदनपाटनेषु तेलपायितं सिरान्यधनस्त्रायुच्छेदनेषु ।

Ibid

³ फलस्य पायनं वक्ष्ये वनौषधिविलिपने ।

येन दुर्मेदवर्माणि भेदयेत् तरुपर्णवत् ॥

Vṛddhya Śāringadhara,

vegetable drugs, which would thus acquire the power of piercing a coat-of-mail as easily as the leaf of a tree”

I

“Make a paste of Pippali (Piper Longum), rock-salt and Kustha (Saussurea Lappa) with cow's urine. These are to be well mixed until the paste becomes cold and yellow. The arrow-heads and other sharp cutting instruments are to be well smeared with that paste and then heated to redness. Then they are to be removed from the furnace and allowed to cool down to a state short of redness and dipped in oil. By this means, the iron acquires special power as a cutting instrument¹”

II

“Make a paste of the five kinds of salts,- mustard and honey. Let the instrument-maker smear it on the Śastras which are then to be heated in a furnace. When the colours resembling those of a peacock's feather are displayed on the Śastra, the burning is known to be adequate. The instrument is then dipped in water.”

¹ पिप्पली सैन्धव कुठ गोमूत्रेन तु पेययेत् ।

अतिशीत मनाविद्ध पीतं नष्ट तथीपधम् ॥

अनेन निपयेच्छस्त्र लिप्त चाग्नौ प्रतापयेत् ।

ततो निर्व्वापितं तैले लीष्टं तत्र विणिष्यते ॥

Vīddhya Śārngadhara

² सर्वावर्चल सैन्धवञ्च विडर्माङ्गिदमेव च ।

सामुद्रेन सहैतानि पञ्चसुलंबणानि च ॥

Vaidyaka

³ पञ्चभिलंबणैः पिष्टं मधुसिक्तं, ससर्पपे ।

एभिः प्रलिपयेच्छस्त्र लिप्तं चाग्नौ प्रतापयेत् ॥

गिखिथीवानुवर्णाभिः तप्तपीतं तथीपधम् ।

ततस्तु विमलं तीर्थं पाययेच्छस्त्रमुत्तमम् ॥

Vīddhya Śārngadhara

III.

The sage Usanās or Śukrācārya thus describes¹ the tempering of swords in the Vīḥat Saṁhitā (Kern's trans Ch L) —

23 The fluid to imbrue a sword with, according to the precepts of Uśanās, is blood, if one wishes for a splendid fortune, ghee, if one is desirous to have a virtuous son, water, if one is longing for inexhaustible wealth

24 An approved mixture to imbrue the sword with, in case of one desirous to attain his object by wicked means, is milk from a mare, a camel and an elephant. A mixture of fish bile, deer-milk, horse-milk, and goat-milk, blended with toddy, will make the sword fit to cut an elephant's trunk

25 A sword first rubbed with oil, and then imbrued with an unguent compounded of the milky juice of the Calotropis, goat's horn, ink, dung from doves and mice, and afterwards whetted, is fit for piercing stone

- ¹ वडवीद्रकरेणुदग्धपान
यदिपानेन समीहतेऽर्थसिद्धि ।
भक्षपिण्डमृगाय वस्तदुग्धै
करिहस्तच्छिदये सतालगर्भे ॥
आकं पयो हुडु विषाणमसीसमेत
पारवतास्तु शक्ता च युतं प्रलीप ।
शस्त्रस्य तैलमयितस्य ततोऽस्य पान
पश्चाच्छित्तस्य न शिलासु भवेद्विधात ॥
क्षारे कदल्या मयितेन युक्ते
दिनीषिते पायितमायसं यत् ।
सस्यक् शितं चास्मनि नैति भङ्ग
न चान्यलोहिष्वपि तस्य कौष्ठ्यम् ॥

26 An instrument imbued with a stale mixture of potash of plantains with butter milk, and properly whetted, will not get crooked on a stone, nor blunted on other non instruments

GOOD AND BAD QUALITIES OF SURGICAL INSTRUMENTS

Suśruta says¹ "The good points in an instrument are the following it should have a well-made handle, affording a firm grasp it should be made of iron of good quality, it should have a fine edge, a pleasant shape and a well-finished point, and it should not be dentated (except the saw)" He gives preference to the Śistras which are of good make and with a fine edge—so fine as to divide the hairs on the skin and whose handles can easily be grasped by the surgeon's hand

On the other hand, he points out eight defects² of sharp instruments they must not be bent, or blunt, or broken, or jagged, or too thick, or too thin, or too long, or too short Instruments free from these defects should be used. The Karapatra or saw is the only exception, for being used for sawing bones, it requires a jagged or dentated edge. Vāgbhata also mentions these defects³

¹ तानि सुयज्ञाणि सुनीक्षाणि सुधारानि सुरूपाणि सुसमाहितमुखाग्रण्यकरालानि चेति शस्त्रसम्पत् ।

Suśruta Samhitā, I viii.

² तत्र वक्रं कुण्ड खण्ड खरधारमतिम्यूलमत्यल्पमतिदीर्घमतिङ्गुलमित्यष्टौ शस्त्रदोषाः । अतो विपरीतगुणमाददीतान्यत्र करपत्रात्तद्वि खरधारमस्थिच्छेदनार्थं ।

Ibid.

³ कुण्ड-खण्ड-तनु-म्यूल-ङ्गुल-दीर्घत्व-वक्रता ।
शस्त्राणां खरधारत्वमष्टौ दोषाः प्रकीर्त्तिताः ॥

Aṣṭāṅga Hṛdaya, I xxvi.

Suśruta enumerates twelve defects¹ of blunt instruments, viz., it may be too thick, or made of impure metal, or too long, or too short, or incapable of being grasped, or capable of being grasped (unevenly) partially, or bent, or made of too soft material, or of elevated ends, or it may have bent, loose, elevated, and weak pins, or be of weak ends, or of thin sides. These faults refer principally to the *Suastika yantras* or the cruciform instruments

THE USES OF INSTRUMENTS

Twenty four different kinds of operations² are said to be performed by the blunt instruments (Suśruta), viz. —

| | | |
|---|-----------|--|
| 1 | Nighātana | Extraction by moving to and fro of śalyanirghātani |
| 2 | Pūrana | Filling the bladder or eyes with oil |
| 3 | Bandhana | Bandaging and binding by rope |
| 4 | Vyūhana | 1 Raising up and incising a part for removing a thorn or 2 bringing together the lips of the wound |
| 5 | Vartana | Contracting or curling up |

¹ तत्रातिस्थूलमसारमतिदीर्घमतिदृक्स्वमयाहि विपमयाहि वक्र शिथिलमत्युन्नत मृदुकील मृदुमुखं मृदुणशमिति द्वादश यन्त्रदीपाः ।

Suśruta Samhitā, I 111

² यन्त्रकर्मानि तु निर्घातनपूरणवन्धनव्यूहनवर्तनप्रचालनविवर्तनविवरणपीडनमार्ग-विशोधनविकर्षणाहरणाञ्जनोन्नमनधिनमनभक्षनीमाधनाचूपणैषणदारणर्ज्जकरणप्रचालनप्रधमन-प्रमार्जनानि चतुर्विंशतिः ।

- | | | |
|---------------------|---|---|
| 6. Cālana | . | 1 transferring, i.e., removing from one part to another, 2, moving a foreign body. |
| 7. Vivartana | . | Turning round |
| 8. Vivarana | | Exposing or opening out any part |
| 9. Piḍana | . | Pressing as by finger to let out pus from an abscess |
| 10. Mūṅga Viśodhana | | Clearing the canals such as the urethra, rectum &c |
| 11. Vikāśana | | 1. Extraction by pulling, or 2, loosening a foreign body fixed in muscles &c. |
| 12. Āharana | . | Pulling out |
| 13. Āñcana | . | Pulling up |
| 14. Unnamana | . | Elevating or setting upright as the depressed cranial bones or ears |
| 15. Vinamana | | Depression as of the elevated ends of the fractured bone |
| 16. Bhañjana | | 1 Rubbing the head, ears &c, 2 contusing a part all round before it is surgically operated on |
| 17. Unmathana | | Probing or stirring the track formed by an impacted foreign body |
| 18. Ācusana | | Suction as of poisoned blood and milk by horns, or gourd, or mouth, |

7. Viśiñvāna To let out pus as from a deep-seated abscess

Instruments — Sūci, kuśapatra, ātimukha, śarīrīmukha, antāmukha, trikucaka, and esani.

8. Sivana . Stitching, as of the lips of a wound by needles

Instruments — The different kinds of sūci or needles

Caraka mentions, however, six kinds¹ of operations —

1. Pātana Incision, as in operation for sinus, abscess, intestinal injury, and deeply impacted foreign bodies
2. Vyūdhana Tapping or piercing, as in operations for ascites, suppurating tumour, ovarian tumour, boils &c

¹ पाटन व्यधनश्चैव च्छेदन लेपन तथा ।
 ग्रीच्छेदन सीवनश्चैव षड्विध शस्त्रकर्म तत् ॥
 नाडीव्रणाः पक्वग्रीवास्तथा घतगुदीदरम् ।
 अन्तःशल्याश्च ये देशा पाद्यास्ते तद्विधाय ये ॥
 दन्तीदराणि सपक्वा गुल्मा ये ये च रक्तजाः ।
 व्यधा ग्रीणितरीगाश्च धीसर्पपिडकादयः ॥
 चद्वहन्तान् स्थूलपर्यन्तानुत्सन्नान् कठिनान् व्रणान् ।
 अशः प्रभृत्यधौमांसं छेदनेनोपपादयेत् ॥
 किलासानि सुकुष्ठानि लिखेह्येत्यानि मुद्धिमान् ॥
 वाताद्यग्न्यापिडकाः सकीटा रक्तमण्डलाः ।
 कुष्ठान्वभिहितश्चाङ्ग ग्रीवाश्च प्रच्छेद्विप्रक् ॥
 सौम्यं कुक्षुदराद्यन्तु गम्भीरं यद्विपाटितं ।
 इति षड्विधमुद्दिष्टं शस्त्रकर्म मनीषिभिः ॥

- | | | |
|---|------------|---|
| 3 | Chedana . | Excision, as in the operation for tumours, raised and thickened <i>mano</i> or corns, and piles |
| 4 | Lekhanti . | Scraping as in operation for some varieties of skin diseases |
| 5 | Pracchana | Scarfing, as in the operations for glands, boils, leprosy nodules, inflammatory swellings, &c |
| 6 | Sibana . | Sewing, as in the operation of laparotomy for deep seated diseases in the abdomen |

Vāgbhata describes thirteen kinds¹ of operations performed by the sharp instruments —

- | | | |
|----|-----------|---|
| 1 | Utpātana | Raising up by incision, as by the Nakhaśastra |
| 2 | Patana | Incision as by the Viddhipatra |
| 3 | Sivana | Stitching as by the Sūci |
| 4 | Esana | Probing as by the Esani |
| 5. | Lekhana | Scraping as by the Maṇḍalāgria |
| 6 | Pracchana | Scarification as by the Maṇḍalāgria |
| 7 | Kuttana | Picking as by the Sūci in tattooing |
| 8 | Chedana | Excision as by the Viddhipatra |

¹ उत्पाद्य पाद्य सीव्य-लेख-प्रच्छन्न कुट्टनम् ।

हेय भयं व्यथो मृत्यो गही दाहय तत्क्रियाः ॥

| | | |
|-----|----------|--------------------------------|
| 9 | Bhedana | Piercing as by the Sharp Esauī |
| 10 | Vyadhana | Tapping as by the Vetasapatia. |
| 11. | Manthana | Churning as by the Khaja |
| 12 | Grahana | Fixing as by the Sandamśa |
| 13 | Dahana | Burning as by the rods |

WHETSTONES

In the Rgveda we find the use of stones mentioned for whetting the edges of the arms of war.¹ The Hindu surgeons used a stone slab for sharpening the śastras or edged instruments - It was of the colour of māsa (Phaseolus Roxb) The whetstones used by the Greeks and Romans were either the marble ointment slabs, or made of clay slate or sandy schistaceous shale

INSTRUMENT CASES

To preserve the edges of the cutting instruments, a case made of the wood of śalmālī (Bombax Malabaricum) was used (Suśruta)² Such cases were also manufactured of canvas, or wool, or silk, or leather These cases—twelve *angulī* (i.e. fingers' breadth) long and nine *angulī* broad—were well sewn and

| | | | | | | |
|----------------------------------|---|-------|----|-------|---|---|
| ¹ See Rgveda, Mandala | 2 | Sūkta | 39 | Verse | 7 | , |
| | „ | 9 | „ | 90 | „ | 1 |
| | „ | 9 | „ | 112 | „ | 2 |
| | „ | 10 | „ | 53 | „ | 9 |
| | „ | 19 | „ | 101 | „ | 2 |

² तेषां निशानार्थं श्लक्ष्णशिला माषवर्णा ।

Suśruta Samhitā, I 111

³ धारसंस्थापनार्थं शाकली फलकमिति ।

consisted of compartments, lined with wool and separated by partitions for each instrument. They could be folded, closed with a rod and firmly tied by a knot¹. The barbers of India still use similar cases for their instruments.

That the razor used to be kept in a case, we know from a passage in the *Vihadānyaka* (800 to 500 B. C.) where the author says "It (the Atman) is here all-pervading down to the tips of the nail. One does not see it any more than a razor hidden in its case or fire in its receptacle"².

¹ स्यान्नवाङ्गुलि विस्तारः सुघनी द्वादशाङ्गुलः ।

चौम पट्टीर्णं कौषेय दुकूलं मृदु चर्मजः ॥

विन्यस्त पाशः सुस्यूतः सान्तरिणांश्च शस्त्रकः ।

शलाका पिहितस्य च शस्त्रकौषः सुसञ्चयः ॥

Aṣṭāṅga Hṛdaya, I २२११

अथ शस्त्राणां सुरचनार्थं शस्त्रकौषं माह स्यादित्यादि । नवाङ्गुलिविस्तारः नवाङ्गुल परिमाणविस्तारविशिष्टः शस्त्रकौषः स्यात् । शस्त्रस्य कौषः शस्त्रकौषः । कौषं चाप् इति लोके । यथा अस्त्रिकौषं इत्यादि । तथा मृदु, घनी, निविडः सुघनः तथा द्वादशाङ्गुलः दैर्घ्येण द्वादशाङ्गुल परिमाण, तथा चौमादिजः । तथा विन्यस्तः यथा क्रमेण कृतः पाशो यस्य स विन्यस्तपाशः । तथा सुष्टु, सूतः कृतः सेवन, सुस्यूतः, तथा सान्तराणि सव्यवधानानि, कर्णास्थानि सेपादिलीममध्येस्थितानि, शस्त्रानि यस्मिन् स सान्तरिणांश्च शस्त्रकः । तथा शलाकायाः पिहितस्य आस्य मुख यस्य स शलाकापिहितस्य तथा सुष्टु सञ्चयी, नापित भाण्डिकवद्राशीकरण यस्य स सुसञ्चयः । चौम अतसीसूत्रभववस्त्रं केनैव सिद्धं स्यात् । दुकूलशब्दः पट्टादिभिः स्त्रिभिः सम्बध्यते । तेन पट्टदुकूल पाट् इति ख्यातेन सूत्रेण निर्मितं वस्त्रं कर्णा, सेपादिलीम तद्भव वस्त्रं श्रीर्णं दुकूलधनात् इत्याख्यं वस्त्रादि । कौषेयदुकूलं कौषकार-कौटम्भव सूत्रेण देशम् इति ख्यातेन निर्मितं वस्त्रं ।

Vāgbhaṭṭārtha Kaumudī

² *Vṛhadāraṇyaka*, I १५

Macdonell's *Sanskrit Literature*, p 22.

To prove that portable cases for medicaments and instruments were in use in ancient India, we quote *in toto* from the Mohāvāgga some references to them ¹

BOXES FOR OINTMENTS, OINTMENT POTS, AND PORTABLE CASES

Now at that time, the Bhikkhus used to put pulverised ointments into pots and saucers. They became sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a box for ointment."

Now at that time the Khabbaggiya Bhikkhus used to carry about various kinds of boxes for ointments—gold ones and silver ones. People were annoyed, murmured and became angry, saying, "Like those who still live in the world."

They told this thing to the Blessed One.

"Various kinds of boxes for ointments, gold ones, and silver ones, are not, O Bhikkhus, to be used. Whosoever does so, is guilty of a dukkata offence. I allow, O Bhikkhus, the use of such boxes made of bone, or ivory, or horn, or of the nala reed, or of bambu, or of wood, or of lac, or of the shells of fruit, or of bronze, or of the centre of the chank-shell (Sankhu-navi)."

2 Now at that time the boxes of ointment had no lid. (The ointment) was sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

¹ Mohāvāgga vi 12 (Sacred Books of the East)

"I allow you O Bhikkhus, the use of a lid."

The lid used to fall off

"I allow, O Bhikkhus, to fasten the lid with thread and tie it on to the box."

The boxes used to fall

"I allow you, O Bhikkhus, to sew the boxes on with thread".

3 Now at that time the Bhikkhus used to rub ointment on with their fingers, and the eyes were hurt

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a stick or holder to put the ointment on with

Now at that time the *Khaddhaggaya* Bhikkhus used to keep various kind of ointment-sticks—gold ones, and silver ones. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world".

They told this thing to the Blessed One

"Various kinds of ointment-holders, O Bhikkhus, are not to be used. Whosoever does so, is guilty of a dukkata offence. I allow, O Bhikkhus, the use of ointment-holders of bone, or of ivory or of horn, or of the nala reed, or of bambu, or of wood, or of lac, or of fruit, or of bronze, or of the chank-shell."

4 Now at that time the ointment-sticks used to fall on the ground and become rough

They told this thing to the Blessed One

"I allow, O Bhikkhus, the use of a case for the ointment-sticks".

Now at that time the Bhikkhus used to carry the ointment-boxes and ointment-sticks about in their hands

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a bag to put the ointment-box in"

They had no shoulder strap

"I allow you, O Bhikkhus, the use of a shoulder strap (by which to carry the ointment-box), or of a thread (by which to sew or tie it on)"

13

1 Now at that time the venerable Pīṇḍavāḷḷha had head-ache

"I allow, O Bhikkhus, the use of a little oil on the head".

(The disease) became no better

"I allow, O Bhikkhus, the practice of taking up (medicine) through the nose" (See commentary on the Dhammapada, pp 83)

The nose-pan

"I allow, O Bhikkhus, the use of a nose-spoon" (Nāṭṭhukarāṇī)

Now at that time the *Khabbaggiya* Bhikkhus had various kinds of nose-spoons—made of gold, and of silver. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world"

They told this thing to the Blessed One.

“Various kinds of nose-spoons, O Bhikkhus, are not to be used. Whosoever does so, is guilty of dukkata offence. I allow, O Bhikkhus, the use of such nose-spoons made of bone, (&c, as in chap 12, 1, down to) the chank-shell

2 The nose took up the medicament in unequal proportions

“I allow, O Bhikkhus, the use of a double nose-spoon (yamaka-natthu-karani)”

They used to spread the drugs on a wick before they sniffed up the aroma and their throats got burnt

‘I allow, O Bhikkhus, the use of a pipe to conduct the aroma’

Now at that time the Kabbaggiya Bhikkhus had various kinds of pipes (&c, as in the last clauses of § 1, down to the end)

Now at that time the aroma-pipes came open and worms got in

‘I allow, O Bhikkhus, the use of a lid to the pipes’

Now at that time the Bhikkhus carried the pipes about in their hands

‘I allow, O Bhikkhus, the use of a bag to carry the aroma-pipes in’

The aroma-pipes rubbed against one another

‘I allow, O Bhikkhus, the use of a double bag’

They had no shoulder strap

‘I allow, O Bhikkhus, the use of a shoulder strap (by which to carry the double bag), or of a thread (by which to sew it on).

OPERATION TABLE

In the examination for piles, *Suśruta* directs the patient to lie down on his bed or on a board¹, and in describing the operation, *Vāgbhata* II mentions a board to be used as an operation-table². A similar bed, as long as the distance from the top of the head to the knees of the patient, is also mentioned in the description of the lithotomy operation³. The use of a board as a fracture bed is also advised.

For passing the tubes of the *vasti-gantri* or clysters into the urethra in the male, the patient is recommended to sit on a stool as high as his knees (*jānumūtrāsano*)⁴.

In phlebotomy, the patient is advised to sit on a stool, an arm high⁵ (i.e. the distance between the tip of the olecranon process of the ulna to the tip of the little finger)

¹ भूतवन्तमुपवेश्य सङ्गृहे शुची देशे साधारणे चर्भे काले समे फलके शय्याया वा प्रत्यादित्य-
गुदमन्यन्तोत्सङ्गे निषण्णपूर्वकायमुत्तान * * * *

Suśruta Samhitā, IV. 11

² शुचिं कृतस्त्रान्यनं भूतविष्णुवमव्ययम् ।

शयने फलके वाग्यनरोत्सङ्गे व्यापयितम् ॥

Aṣṭāṅga Hṛdaya, VI. 111.

³ तस्य वलवन्तमविक्रवमाजानुसमे फलके प्रागुपवेश्य पुरुषश्च तस्योत्सङ्गे निषण्णपूर्वकाय-
मुत्तानमुन्नतकटीकं ।

Suśruta Samhitā, IV. 111

⁴ क्षातस्य भूतभक्तस्य रसेन पयसापि वा ।

सृष्टविष्णुवैद्यस्य पीठे जानुसमे मृदी ॥

Cāraka Samhitā, VIII. 11

⁵ तच्च व्यधसिर पुरुष प्रत्यादित्यमुखमरविमात्रोच्छिते उपवेश्यासने ।

Suśruta Samhitā, III. 111

अग्नितापातपखिन्नो जानुश्चासनसंस्थितः ।

मृदुपद्माक्षकेशान्त्रो जानुस्थापितकर्परः ॥

Aṣṭāṅga Hṛdaya, I. 111111.

KAPPA ŚAYANA OR FRACTURE-BED

In the treatment of fractures of the lower extremities, mention is made of the *lapāta sayana* (lit. door-bed) or fracture bed consisting of a plank of wood resembling the panel of a door.¹ The patient is to lie down on it. The board has five rods fixed to it, to which the fractured limb is tied to prevent any movement—two on each side of the joint and one on the plantar surface of the foot. Dillenc explains it thus:—In fractures of the bones of the leg, two rods are fixed on each side of the ankle and one supports the foot; in fracture of the thigh bone, two rods are fixed on each side of the knee or hip, and one under the foot. In a double fracture of the thigh bone and bones of the

१ यदा यदा भगवन्नामं प्रपाद्यते विना ।
 कदापि न भगवन्नामं पश्येत्तदा विना ।
 यदा भगवन्नामं प्रपाद्यते विना ।
 मुनिभ्योऽपि नो विना भगवन्नामं ।
 यदा भगवन्नामं प्रपाद्यते विना ।
 भगवन्नामं प्रपाद्यते विना ।

Suśruta Saṁhitā, IV. 31

- अतोऽपि पञ्चान् मन्त्रान् पठितुं शक्यम् । अथ जडोऽपि । जडोऽपि
 विकृतचित्तः । भद्राणाम् शान्त्यभ्यासान् । निविधानधीत्यपरं । कषाटशयनसमयं
 काशम् । चाननम् कषाटं न्यनीतम् । अतस्तत्तन्मन्त्रम् । आधारशयनसमयं
 मन्त्रम् । आध्यात्मिकशयनसमयं पञ्चमम् । कालानां पञ्चमम् ।
 जडोऽपि दीर्घोऽपि कृतम् भगवत्पुत्रः स तदा भगवत्पुत्रः गुणकृतम् भगवत्पुत्रः
 स तदा भगवत्पुत्रः भगवत्पुत्रः । अतस्तत्तन्मन्त्रम् । अथ जडोऽपि ।
 पञ्चमम् । अतस्तत्तन्मन्त्रम् । अतस्तत्तन्मन्त्रम् । अतस्तत्तन्मन्त्रम् ।
 पठन्ति । तन्निवृत्त्यर्थम् पठन्ति । तन्निवृत्त्यर्थम् पठन्ति । तन्निवृत्त्यर्थम्
 पठन्ति । तन्निवृत्त्यर्थम् पठन्ति । तन्निवृत्त्यर्थम् पठन्ति ।

leg, seven rods are required,—two on the outer side of the ankle, knee, and groin, respectively, and one under the foot. The fracture-bed is recommended to be similarly availed of in fractures and dislocations of the loin, the spinal column, the chest, and the clavicle. And this mode of treatment, he adds, may advantageously be used for the other kinds of fractures and dislocations. Vāgbhata II also mentions it in the treatment of fractures¹

Hippocrates used a similar fracture-bed for the proper treatment of fractures and dislocations. It was called *Scammum Hippocraticum* or bench of Hippocrates. As the figures of this bench would elucidate the structure of the *kupāta-sayana*, we reproduce here three plates with their explanations given at the end of Vol. II, *Genuine Works of Hippocrates* (Syed Soc Ed), and two plates—*Scammum Hippocraticum* and *Plinthium Nilii* from the *Collection De chirurgiens Grecs*.

Fig 1 The *Scammum Hippocraticum* or Bench of Hippocrates, as represented by Andreas Cruce (*Officina chirurgica venetus*, 1596)

Fig 2 The same as represented by M. Littre

A A board, 6 cubits long, 2 broad and 12 inches thick, not 13 as incorrectly stated by M. Littre

B The feet of the Axles, which are short

¹ कटी जङ्घीरुभग्नानां कपाटशयनं हितम् ।

यन्त्रणार्थं तथा कीलाः पञ्च कार्य्या विवन्धनाः ॥

जङ्घीर्वीं पार्श्वयोर्द्धा द्वौ तल एकय कीलकः ।

श्रोण्या वा पृष्ठवर्गे वा वक्रस्याचकयोस्तथा ॥

CC Axle-trees

DD Grooves 3 inches deep, 3 broad, separated from one another by 4 inches

E A small post or pillar, fastened in the middle of the machine in a quadriangular hole.

F Pillars a foot long

G A cross-beam laid on the pillars FF, which can be placed at different heights by means of holes in the pillars

Fig 3 Representation of the mode of reducing dislocation of the thigh outwards, as given by M Littre (Œuv. d'Hipp, tom iv, p 305).

A mistake in the figure given by M. Littre is here corrected.

A A lever applied to the nates of the luxated side, and acting from without inwards, in order to bring the head of the bone into its cavity

B Another lever, held by an assistant, put into one of the grooves of the machine, and intended to act against lever A.

C Groove in which the end of the lever A takes its point of support

D The luxated member

EE Extension and counter-extension.

Fig 4 Banc d'Hippocrate, d'après Rufus, servant à réduire différentes luxations (Collection De Chirurgiens Grecs, Bibliothèque Nationale)

Fig 5 Plinthium, ou cadie de Nileus, d'après Hérodote (Ibid)

CHAPTER IV.

THE NUMBER OF SURGICAL INSTRUMENTS

The armamentarium of the Hindu surgeons consisted of a good number of surgical instruments. They are described to be of two kinds, the *yantras* and the *śastras*, i.e., the blunt and the sharp instruments. Suśruta enumerates no less than one hundred and one varieties of the blunt instruments, and twenty different kinds of sharp instruments. Hārīta, on the other hand, enumerates twelve blunt instruments, twelve sharp instruments, and four *prabandhas*, as necessary for the operation of extraction of arrows and other foreign bodies¹. Vāgbhata II mentions one hundred and fifteen kinds of blunt and twenty-six kinds of sharp instruments. Pālakapya (Treatment of Elephants) mentions ten kinds of *śastras* or sharp instruments though he describes the uses of other instruments required for the surgical treatment of diseases.

INSTRUMENTS AND THEIR CLASSIFICATION (SUŚRUTA)

Of the one hundred and one varieties of the blunt instruments, the surgeon's hand is rightly considered as the principal instrument, for without its help, no instrument can properly be used, and every surgical operation is under its control². They are recommended to be used for the extraction

¹ द्वादशेव तु यन्त्राणि शस्त्राणि द्वादशेव तु ।

चत्वारि च प्रवन्धाना शस्त्रीद्वारे विनिर्दिशेत् ॥

² यन्त्रशतमेकीत्तरमव द्दशमेव प्रधानतम यन्त्राणामवगच्छ । किं कारणं । यस्माद्दशोद्दिष्टे यन्त्राणामप्रवृत्तिरेव तदधीनत्वाद्यन्त्रकर्माणा ।

तत्र मन,शरीरावाधकराणि शस्त्रानि तेषामाहरणीयायी यन्त्राणि ।

of *śalya* or foreign bodies, *e g*, a dart, an arrow, a javelin, a spear, a peg, a pin, a bamboo rod, a stake &c which cause pain to the body and mind

A Suśruta subdivides the blunt instruments into six classes,¹ viz

| | | |
|-----|-----------------------------------|---------------|
| I | Svastika or cruciform instruments | . . 24 kinds. |
| II | Sandamśa or pincher-like | 2 „ |
| III | Tāla or picklock-like | 2 „ |
| IV | Nālī or tubular or hollow | . 20 „ |
| V. | Śalākā or rod or picker-like | 28 „ |
| VI | Upayantra or accessory | 25 „ |
| | | 101 |

These instruments are advised to be made generally of iron, or of other suitable materials, when iron is not available. Their ends often resemble the faces of some ferocious beasts, or of deers, or birds. Hence the instruments should be so constructed as to have the likeness of their faces, following at the same time the directions of scientific treatises, or the instructions of teachers, or in imitation of other instruments, or in adaptation to the exigencies of the time. They should be of reasonable

¹ तानि षट्प्रकाराणि । तद्यथा । स्वस्तिकयन्त्राणि । सन्दश्यन्त्राणि । तालयन्त्राणि । नाडीयन्त्राणि । शलाकायन्त्राणि । उपयन्त्राणि चेति । तत्र चतुर्विंशति स्वस्तिकयन्त्राणि । द्वे सन्दश्यन्त्रे । द्वे एव तालयन्त्रे । दिंशतिर्नाड्यः । षट्त्रिंशति शलाकाः । पञ्चविंशति रूपयन्त्राणि ।

Suśruta Samhitā, I vii.

Hessler translates the terms as follows *Uncinata instrumenta*, *forcipum instrumenta*, *palmiformia instrumenta*, *hamata instrumenta*, *secundaria instrumenta*,

Hessler's Suśruta, I vii,

size, with their ends rough or smooth as required. They should be of strong make, good shape and capable of a firm grasp.¹

I The Svastika or Cruciform instruments are—

- 1 Samhamukha 2 Vyāghramukha 3 Vrkamukha
- 4 Taraksumukha 5 Rksamukha 6 Dvipimukha
- 7 Mājūramukha 8 Śīgālamukha 9 Anvārakamukha
- 10 Kākamukha 11 Kankamukha 12 Kumaramukha
- 13 Cāsamukha 14 Bhāsamukha 15 Śisaghātīmukha
- 16 Utkamukha 17 Cillimukha 18 Gidhramukha
- 19 Śyenamukha 20 Krauñcamukha 21 Bhingurāmukha
- 22 Añjalikarnamukha 23. Avabhañjanamukha, and
- 24 Nandimukhamukha

II. The Sandamśa or pincher-like instruments are—

- 1 Forceps with arms
- 2 Forceps without arms

¹ तानि प्रायशी लीष्टानि भवन्ति तत्प्रतिष्पकाणि या तदग्भाभे । तत्र नानाप्रकाराणां व्यालानां मृगपक्षिणां मुग्धेषु खानि यत्ताणां प्रायशः सदृशानि तस्मात्तत्सारप्यादागमादुपदेशादन्ययन्तदर्शनादुपक्रियत इति कारयेत् ।

समाहितानि यन्त्राणि खरग्रणमुग्धानि च ।

सदृशानि सुरुपाणि सदृशाणि च कारयेत् ॥

Suśruta Samhitā, I 111

अनेकरूपकार्याणि यन्त्राणि विविधान्यत ।

विकल्प्य कल्पयेद् बुद्ध्या यथास्थूलान् वक्ष्यते ॥

* * * * *

अलीशान्यनुशस्त्राणि तान्येवञ्च विकल्पयेत् ।

अपराण्यापि यन्त्रादीन्यपयोगञ्च यौगिकम् ॥

Aṣṭāṅga Hīdaya, I 111.

III. The Tala or pichled like instruments are—

1. Ekāṭṭā

2. Dvāṭṭā

IV. The Nāḍi or tubular instruments are—

| | |
|--|-------|
| For fistula in ano . . . (1) with one chit, (2) with 2 chits . . . | 2 |
| For piles . . . (1) with one chit, (2) with 2 chits . . . | 2 |
| For wound | 1 |
| For clysters (Rectal) . . . (Some authors describe 3 only) . . . | 2 |
| For clysters (vaginal and urethral) . . . (male and female) . . . | 3 |
| For Hydrocele | 1 |
| For Ascites | 1 |
| For fumigation and inhalation | 3 |
| For Urethral Structure | 1 |
| For Rectal | 1 |
| For Cupping—gourd | 1 |
| | <hr/> |
| | 20 |

V. The Śulākā or rod-shaped instruments are—

| | |
|---|---|
| Gandhīpadamukha or earth-worm like . . . | 2 |
| Śarapunkhamukha or arrow-stem like . . . | 2 |
| Sarpasānamukha or snake's hood like . . . | 2 |
| Yachśamukha or fish-hook like . . . | 2 |
| Masūradalamukha or masūra pulse like . . . | 2 |
| Promāṇjāni or swabs | 6 |
| Khallamukha or spoons | 3 |
| Jāmbāvavadana or jambul seed like . . . | 3 |
| Ankuśavadana or gourd like | 3 |
| Kolāsthīdalāmukha or plum seed like . . . | 1 |
| Mukulāgri or bud shaped | 1 |
| Mālātīpuspavīntāgri or like the stem of mālātī flower . . . | 1 |

VI The Upayantia or accessory instruments are—

1. Rajju—thread
- 2 Venikā—twine
- 3 Patta—bandages
- 4 Carma—leather
- 5 Valkala—bark of trees
- 6 Latā—creepers
- 7 Vastīa—cloth
- 8 Asthilāsma—stone or pebble
- 9 Mudgara—hammer
- 10 Pāmpādātala—palm of the hand and sole of the foot
- 11 Anguli—finger
- 12 Jihvā—tongue
- 13 Danta—tooth
- 14 Nakha—nail
- 15 Mukha—mouth
16. Vāla—hair
- 17 Aśvakataka—the ring of a horse's bridle
- 18 Śākhā—branch of a tree
- 19 Sthivana—spittle
- 20 Pravāhana—flusing the patient
- 21 Harsa—objects exciting happiness
- 22 Aṇaskūnta—a loadstone
- 23 Ksāra—caustic
- 24 Agni—fire
- 25 Bhesaja—medicines

B. The sharp instruments or śastras are—

1. Maṇḍalāgra or round headed knife
- 2 Karapatīa or saw (*lit* like the human hand)
3. Viddhipatīa (*lit* like the leaf of viddhi—an unknown medicinal plant)—a razor
- 4 Nakha-śastīa or nail-paier
5. Mudrikā or finger-knife (like the last phalanx of the index finger)
- 6 Utpalapatīa, a knife, *ie*, resembling the petal of a blue lotus, (*Nymphaea stellata*, Willd)
7. Aiddhadhāna or a single-edged knife.
- 8 Sūci—needles
9. Kuśapatīa—a knife shaped like the kuśa grass (*Eragrostis Cynosuroides*)

- 10 Ātmukha—a knife shaped like the beak of the Ātī bird (*Turdus Gingimannus*)
- 11 Śarīrī-mukha—a pair of scissors like the beaks of Śarīrī bird
- 12 Antarmukha (*lit* having internal sharp edge)—a kind of scissors.
- 13 Trikurcaka—an instrument consisting of three needles
- 14 Kuthārikā—a small axe shaped instrument
- 15 Vīṭhmukha—a trocm shaped like a grain of rice
- 16 Aṭā or awl
- 17 Vetasa-patrīka—an instrument shaped like the leaf of a rattan (*Calamus Rotang*).
- 18 Vadiśa—an instrument shaped like the fish-hook.
- 19 Dantaśmku or tooth-pick
- 20 Esanī or sharp probe-like instrument

According to Hārīta¹ the twelve blunt instruments are—

- 1 Godhāmukha or iguana-faced 2 Vajramukha—gṛdhra-mukha² 3 Tribaktī or three faced 4 Sandamśa or pincher.

¹ गोधामुखं वज्रमुखं चित्रं नाम सन्दशचक्राकृतिकद्वयपादम् ।

अथानकं शङ्खककुण्डलञ्च श्रीवत्सस्रीवत्सिकं पञ्चवक्त्रं ।

हृद्देशेनानि धन्वाणि कथितानि भिषग्वरेः ।

अथ शस्त्राणि प्रोक्तानि नामानि च पृथक् पृथक् ।

अर्धचन्द्रं व्रीहिमुखम् कद्वपत्रं कुठारिका ।

करवीरकपञ्चञ्च शपाककरपत्रकम् ।

वडिशं गृध्रपादञ्च श्ली च सूचिमुद्गरम् ।

शस्त्राण्येतानि प्रोक्तानि शल्योद्धारि पृथक् पृथक् ॥

- 5 Cakrākṛtī or circular shaped 6 Anaka ? 7 Kaṇkapāda ?
 8 Śinga or horn 9 Kundala ? 10 Śribatsa ? 11 Saubatsikā ?
 12 Pañcabaktīam, i.e., five faced—simhamukham ?

The twelve sharp instruments of Hārīta are—

- 1 Aiddhacandīa or half-moon shaped 2 Vrihimukha
 3 Kankapatra 4 Kuthārikā 5 Karavīrakapatraka 6 Śalākā
 or sharp probe 7 Karapatraka or saw 8 Vadhīśa or sharp
 hook 9 Grdhrapāda ? 10 Śūlī 11 Sūci or needle 12 Mud-
 gara or hammer ?

Vāgbhata II classifies the instruments in the following way -

A Blunt instruments—

I Svastika, as heron, lion, bear, crow, deer

forceps &c

24

II Sandamśa It consists of two iron

blades soldered at one end, the other

ends being free

2

(a) for extraction of eyelashes &c

1

(b) mucutī

1

III Tāla

2

(a) Ekatāla

1

(b) Dvītaḷa

1

IV Nāḍī or tubular

23

(a) Kaṇṭhaśalyāvalokīni or throat speculum

having three and five holes

2

(b) Śalyanughātāni

1

(c) For piles, different sizes for male and
 female

6

For inspection 2 holes—rectal speculum

2

For medication 1 hole

2

For applying pressure entire—sāmī

2

| | |
|--|----|
| (d) For instilling into eye with one and two holes | 2 |
| (e) For nasal polypus &c | 1 |
| (f) Anethersnaka or finger spread | 1 |
| (g) Anethersnaka or external speculum | 1 |
| (h) Anethersnaka or sound carrier | 1 |
| (i) For dissection of Pericentesis of abdomen | 1 |
| (j) Anethersnaka or Pericentesis of rectal canal and
rectum | 3 |
| (k) For Curettage | 1 |
| (l) Cupping instrument: Aksha Ghraṣṭra
and Hern | 3 |
| | — |
| | 23 |

VI. Sādhya or red line instruments 34

| | |
|--|----|
| (a) Gāṇḍīpāṇi or earth worm shaped | 2 |
| (b) Māṇḍīpāṇi | 2 |
| (c) Śūṇḍī | 9 |
| Pāṇḍīpāṇi or needle hook | 2 |
| Śūṇḍīpāṇi or | 2 |
| Vāṇḍī or blunt hook | 2 |
| Gāṇḍīpāṇi or delivery hook | 1 |
| Māṇḍīpāṇi or lithotomy hook | 1 |
| Śūṇḍīpāṇi or tooth extractor | 1 |
| (d) For wiping out discharges | 6 |
| For rectum | 2 |
| For nose | 2 |
| For ears (karnaśodhana) | 2 |
| (e) For application of actual and potential
cauteries | 11 |
| Jāmbovāṣṭha, three for each | 6 |

| | |
|---|-------|
| Arddhendu or half-moon shaped, for hernia | 1 |
| Kolāsthidala for nasal polypus | 1 |
| Nail-shaped | 3 |
| (f) For cleansing | 3 |
| Rectum | 1 |
| Vagina | 1 |
| Urethra | 1 |
| (g) Collyrium probe | 1 |
| | <hr/> |
| | 34 |

VI Anuyantia or accessory instruments are nineteen in number To the list of Suśruta he adds the following¹ —

Goat's gut, silk, lime, suppuration, and fear

B The sharp instruments of Vāgbhata are twenty-six in number²

1 Mandalāgria 2 Vrddhipatīa 3 Utpalapatīa 4 Adhyar-ddhadhāra 5 Sarpāsya 6 Esanī —Gandūpadamukhū and Sūci-mukhā 7 Vetasa 8 Śarīrī 9 Tīkucaka 10 Kuśapatra 11 Ātīvadana 12 Antarmukha and Arddhacandrāna 13 Vrihibaktra 14 Kuthārī 15 Kuṇavakasālū 16 Angulī-śastra 17 Vadhīśa 18 Karapatīa 19 Kartarī 20 Nakhaśastra 21 Dantalekhana 22 Sūci 23 Kuṇca 24 Khaja 25 Ālā 26 Karnavedhanī

¹ अनुयन्त्राण्यस्तान् रज्जु वस्त्राऽग्नौ मुद्रता ।

पट्टान् जिह्वा बालाश्च शङ्खा नख सुख द्विजा ॥

काल पाक कर पादीभय हर्षय तत् क्रिया ।

उपायवित् प्रविभजेदालोच निपुण' धिया ॥

Aṣṭāṅga Hṛdaya I १११

² षड्विंशति सुकर्मार्षेष्टितानि यथाविधि ।

शस्त्राणि रोमवाहीनि बाहुल्येनाहुलानि षट् ॥

सुरूपाणि सुधाराणि सुग्रहाणि च कारयेत् ।

अकरलानि सुभात सुतीक्ष्णावार्त्ततेऽयसि ॥

Bhāvamiśra mentions the following blunt and sharp instruments Esant, Jāmyoubastha Śalā,¹ Śūci² and knives generally in making incisions which should be shaped like Kharṣṭāpatrika, (like the leaf of Kharjūna tree, Phoenix Sylvestris, Roxb.) Arddhacandha, Candhavaiga, Śūcimukha and Abhūmukha.³

Pilakapya⁴ mentions ten kinds of Śastras —1 Viddhipatra. 2 Kuśāpatra 3 Mandalāgra 4 Viṭhumukha 5 Kuthūl. 6 Vatsadanti 7 Utpalapatra 8 Śalākā 9. Śūci or needles 10 Rampika Besides these he refers to Vadhā

Of the blunt instruments he mentions —Jāmyoubastha—(four in number, for application of actual cauteries), Simhadamstā, Godhūmukha, Kankamukha, Kulīśmukha—(for extraction of foreign bodies), Esant or probes (three), wound syringe, Vasthyantia, Śalākā or rods, vasthyantia, Karkataka, Dyātūtha, Makiraka (crocodile), Sāuddūlamusthika (tiger's claws), Nandimukha (Turdus gingivianus)

¹ एषा गतिमन्विष्य चारुतादुसारिणीम् ।

सूचीं निदध्यादस्य ते प्राग्नाम्याग विनिररेत् ॥

Bhāva Prakāśa II. 11., Nādi Vranādhikāra.

² चागन्तुं सिपयार्थं शस्त्रेणीतृकस्य ययत ।

आग्नीष्टोनाप्रियर्षेण तप्तया वा शलाकया ॥

Ibid. Bhagandarādhikāra

³ गतिमन्विष्य शस्त्रेण हिन्दात खर्जूरपत्रिकम् ।

चन्द्रार्धं चन्द्रवर्गं सूचीमुखमषाक्षुखम् ॥

Ibid

⁴ तस्य शस्त्राणि दशनामसंस्थानानि भवन्ति । तद्यथा वृजिपत्रम्, कुशपत्रम्, मण्डलाग्रम्, व्रीहिमुखम्, कुठाराकृति, वत्सदन्तम्, उत्पलपत्रम्, शलाका, सूची, रम्भकयेति । फालजाम्बवतापिकादध्याकृतयथेति । एतान्याग्निकर्माविधाने चत्वारि चान्यानि शल्यस्तरणानि यथायीग सिद्धद्रुं गोधामुख कद्रुमुख कुलिशमुख चेति । तिस्र एपिणयः ।

Hastī Āyūrveda, III. 111

CHAPTER V

DESCRIPTION OF THE BLUNT INSTRUMENTS

Now we shall describe the instruments in detail. The Yantras or the blunt instruments will be considered first, and next the Śastias or the sharp instruments.

I. The Svastika yantra or Cruciform Instruments.

The word *svastika* is a technical term signifying one of the twenty-four signs of the Jinas, and it can be represented by two lines crossing each other, the arms of the cross being bent at their extremities towards the same direction. So these instruments may be described as cruciform. They have, as a rule a length of eighteen anguli. Their ends should be shaped like the faces of the following ferocious beasts (1 to 8), deer (9), and birds (10 to 24), and the instruments are to be called after their names.¹ They are divided into two classes: the instruments of class I resemble the mouths of lion (*simha*) and tiger (*vyāghra*), while class II comprises the instruments which have the likeness of the faces of birds of prey. The fulcrums of these instruments which are at the middle, are of the size of a *masūia* (*Eivum lens*). The handles are either rounded off, or bent at an angle at their ends, like an elephant driver's goad—the object being to afford a good grasp of the instrument by the surgeon's hands. The *svastika* instruments are used for the extraction of

¹ तत्र स्वस्तिकयन्त्राष्टादशानुलप्रमाणानि सिद्धव्याघ्रकतरकुम्भचक्षीपिमाज्जरशालग्रै
व्ज्वाककाककङ्कुररचासभासशशघालुक्चिल्लिथ्येनट्टप्रकौञ्चभङ्गराजाञ्जलिकर्णवभञ्जननन्दि-
मुखमुखानि मधुरारुतिभिः कीलैरववहानि मूलेऽङ्गुशवदाहचवारङ्गाण्यास्त्रिविणट्गन्धोद्धार-
णार्थमुपदिश्यन्ते ।

foreign bodies impacted in the bones¹ If the foreign body is visible, extract it by the lion forceps or similar forceps of class I If it is invisible, it should be extracted by the Heron forceps or similar forceps of class II Of all the varieties of svastika instruments, the Heron forceps (kankamukha) is the best for it can be easily introduced and turned in all directions, and also it grasps firmly and extracts a foreign body with ease and can be applied without any harm to all parts of the body²

Class I —

1 Sunhamukha svastika or Lion-faced forceps—this instrument is said to have its mouth shaped like that of a lion (Felis leo) It is the principle instrument of the class I It is

1 तुण्यानि कडसिर्जकाकाटिगमपक्षिणा ।
 मुग्धमुग्धानि यन्त्राणां कुप्यांस्त सशकानि च ॥
 अट्टाट्टाट्टनयासापायमानि च भरिश ।
 ममराकारपशनी' कण्ठेवदानि कीलकी' ॥
 विद्यात सग्निक यन्त्राणि मृगिऽदुश्नतानि च ।
 ते दृष्टं रश्मिर्नदम शय्याहरणमिव्यते ॥

Asṭāṅga Hṛdaya I २२१

- दृश्य सिद्धमुख्याद्यन्तु गृह कडमुख्यादिभिः ।
 निरंरितु शनं शय्य शास्त्रयुक्तियपेक्षया ॥
 विषर्तते साध्यवगाहते च शय्य निगृह्योपरते च यस्यात् ।
 यन्त्रेष्वत कडमुखम् प्रधानं स्थानेषु सर्वेष्वधिकारि चैव ॥

Suśruta Saṃhitā I १११

निवर्तते साध्यवगाहते च
 शय्य गृह्योपरते च यस्यात् ।
 यन्त्रेष्वत, कडमुखं प्रधानं
 स्थानेषु सर्वेष्वधिकारि यश्च ॥

Asṭāṅga Hṛdaya, I, २२१,

curious that in modern times, the European surgeons use a pair of forceps called the Lion forceps for holding bones firmly during operations. So the Makaramukha of Pālakapya is the Crocodile forceps

2 Vyāghramukha or Tiger forceps the mouth of this instrument is like that of a tiger (*Tigris regalis*)

3 Vrkamukha or Wolf forceps (*Canis lupus*)

4 Taraksumukha or Hyena forceps (*Hyena striata*)

5 Rksamukha or Bear forceps (*Ursus Americanus*)

6 Dwīpimukha or Panther forceps (*Felis pardus*)

7 Mājāramukha or Cat forceps (*Felis domestica*)

8 Śrgālamukha or Jackal forceps (*Canis aureus*)

9 Anbbāruka or Deer forceps (*Cervus elephas*)

Class II —The birds, in imitation of whose faces the instruments of this class are made, can be identified from the following description of their beaks —

Birds 1 Raptatories they have curved beaks hooked at the extremity

(a) Strigidae owls strong hooked beaks bent down from base

(b) Vulturidae vultures long straight beaks bent down at tip

(c) Accipetridae falcons, osprey and eagle short, usually dentated beaks, hooked at the ends

2 Pessaries (a) Lanidae shrike hooked and strongly serrated beak (b) Corvidae crow and blue-jay beaks strong, thick, somewhat curved anteriorly and slightly notched

3 Gallatories Heronidae or Ardeidae herons and kiauñca they have long and powerful beaks with sharp hard

edges, somewhat curved at the point, rarely spoon-shaped, with long neck

The instruments are—

- 10 Kākamukha or Crow forceps (*Corvus corone*)
- 11 Kankamukha or Heron forceps (*Ardea ceneria*)
- 12 Kuṇṇamukha or Osprey forceps (*Pandion haliaetus*)
- 13 Cāsamukha or Blue-jay forceps (*Garrulus* or *Corvus cristatus*)
- 14 Bhāsamukha or Eagle forceps
- 15 Śūṣighātīmukha or Hawk forceps (*Nanclerus furcatus*)
- 16 Uṭṭikamukha or Owl forceps (*Strix flammea*)
- 17 Cillimukha or Kite forceps (*Milvus icimus*)
- 18 Śyenamukha or Vulture forceps (*Vulture cinereas*)
- 19 Gīdhramukha or Falcon forceps (*Peregrine falcon*)
- 20 Kīrañcīmukha (*Ardea jaculator*), or Curlew (*Numenius Arquatus*)
- 21 Bhrugarājānamukha or Fork-tailed or Butcher-bird forceps (*Lanius excubitor*).
- 22 Añjalikāṇānamukha—birds not identified
- 23 Avabhañjanamukha „ „ „
- 24 Nandimukhamukha (*Turdus Ginginianus*)

II. The Sandamśa or Pincher-like Forceps.

The second class of instruments—the Sandamśa¹ or pincher-like forceps—comprises only two instruments the forceps with and without handles. The first variety is likened

¹ सनियहोऽनियहस्य सन्दशो पीडशाहुली भवतस्त्वमासिरास्त्रायुगसश्लोद्धारणार्थं सुपदिश्यते ।

to forceps with arms, used by the barbers for depilating the nasal cavities, while the second variety is like the aimless forceps used by the goldsmiths. The former consists of two arms joined crosswise by a pin fixed at about their middle points, and so really is a cruciform instrument but is classed here for its different use in surgery. The forceps without handles consists of two blades soldered at one end. Some commentators like to subdivide the pinchers into two classes according as their ends are rough or smooth. And so Hessler translates ¹ "Duæ forcepes denticulata et non denticulata"

The sandamśas are used for the purpose of extracting foreign substances from the soft structures of the human body, such as the skin, muscles, veins, nerves, and tendons. Generally they have a length of sixteen angulī

Vāgbhata II mentions two other instruments as modifications of the type —

(a) One variety has the length of six angulī. It is intended for the purpose of extracting minute foreign bodies such as thorn, hair &c. and of removing the superfluous eyelashes.

Cakrapāṇi also advises us to use a sandamśa for epilation, which may be called the Epilation forceps ⁴

¹ Hessler's Suśrūta Caput vii P 14

² कीलवद्ध श्वित्कार्या सन्दर्शी पीडशाङ्गुली ।
त्वक्सिरास्त्रायुपिणित लग्न शल्यपकर्षणे ॥ ५ ॥

Aṣṭāṅga Hṛdaya, I ११४

अतिगुप्तञ्च शल्यञ्च सन्दर्शेन समुद्धरेत् ।

Hārīta Samhitā, III 111

³ षडङ्गुलीऽन्वोद्धरणे सूक्ष्म शल्यो पपञ्चराणां ॥ ६ ॥

Aṣṭāṅga Hṛdaya, I ११५

⁴ See foot note 2, p 66

Similarly in modern times, we remove superfluous eyelashes by the Epilation forceps Mr Berry writes¹ —“When the trichiasis is only partial, a temporary improvement is obtained by epilation In some cases where a few eyelashes only have been left altogether, the patient may procure for himself a pair of forceps, and have the eyelashes removed whenever they cause irritation” Surgical epilation was frequently necessary for trichiasis among the Romans and a similar forceps was in use there²

In ancient times in India, the barbers used epilation forceps for pulling out grey hairs In Makha-deva jātaka, we find the following conversations between the king and his barber³ —

“Barber There is a grey hair to be seen on your head, O King’

King Pull it out, then, friend, and put it in my hand.

So he tore it out with golden pinchers, and placed it in the hand of the King ”

(b) The second variety is known as the Mucutī instrument⁴ It is a pair of straight forceps, having no curve like that of the sandamśa It is serrated finely at the open ends The soldered end has a ring attached to it as ornamentation. It is recommended to be used for removing painful sloughs and proud granulations from a deep-seated abscess It is also to be used to

¹ Practical Ophthalmology, 1901 By G A Berry, M B. P 52

² Paulus Aegineta VI. viii (Syd Soc Ed.)

³ Rhys David's Buddhistic jātaka stories, Vol I, pp 187

⁴ मुचुटी सूत्रं दन्तर्जुमूले रुचकभूषणा ।

गम्भीरं व्रणमांसार्त्तिं चाम्पणं शोषितस्य च ॥ ७ ॥

complete the operation for pterygium by removing the remnant, after it has been extirpated by the sharp instruments. Suśruta calls it Mucundī¹, and uses it to hold the pterygium after it has been raised by vachīśa or hook. It must be then a smaller variety of mucutī.

A similar pair of forceps, Dr. Erichsen mentions, and says that "for the purpose of extracting needles, thorns, splinters of wood and other foreign bodies of small size and pointed shape lying in narrow wounds, forceps with very fine but strong, well-serrated points will be found useful."

Suśruta mentions bamsabīdalā or bamboo forceps. It is made of a piece of bamboo rod, split longitudinally into two halves nearly to its whole extent. This is like the bamboo tongs used by the smokers in Bengal to raise glowing charcoal to the earthen bowl. It should be used to remove worms from the surface of the human body.

The sandamśa instrument may be compared with the modern dressing forceps and with the forceps still used by the goldsmiths, known as a sonnā. Those with arms have then counterpart in the sādāsī or a pair of pinchers, still used by the blacksmiths.

III. Tāla Yantra or Picklock-like Instruments.

The third class of blunt instruments is called Tāla-

¹ अपाङ्ग प्रेक्षमाणस्य वडिशेन समाहितः ।

मुचुण्डागृह्णन्निधायी सूक्ष्मसूत्रेण वा पुनः ॥

Suśruta Samhitā, VI ११

² Erichsen's Science and Art of Surgery, Tenth Ed. vol. I p. 342

³ ताननुवैलीनाभ्यक्तस्य वशविदलीनापहरेत् ।

Suśruta Samhitā, IV ११११

yantra¹ The word tāla "has been differently interpreted by the commentators Bhānumati gives the alternative reading (tālu i.e., palate) for tāla, so the instruments likely had then ends shaped like the palatine process of fish Dallana, however, maintains that tāla means picklock, the ordinary Indian key which resembles a hook Two of these are joined at one end, the curved ends being kept free, facing one another The instrument would then resemble the face of a bhetuh fish Instruments with one tāla or hook resemble one lip of the fish, and those with two tālas represent its entire face Both Cakrapāni and Dallana however prefer to mean by tāla, the scale of a fish"

They have a length of twelve anguli, and are shaped like the jaws of a fish They may be made either with a single blade (ekatāla) or with double blades (dvitāla) soldered at one end, the hooked ends being free They are intended for the purpose of extracting foreign bodies from the ear, nose and other outer canals of the body The ear scoop now used by the barbers of India for extracting wax from the ear is a tālayantra

¹ तालयन्त्रे पाटशङ्खनि मत्स्यतालवर्षट्कतालदितालके कर्णनामानाडीशानानामा
ररक्षाय ।

Suśrūta Samhitā, I vii.

ये पाटशङ्खनि मत्स्यतालवर्षट्क तालके ।

ताल यन्त्रे कर्णनाडी शल्यापणनिष्ठी ॥

Antarāṅga Hṛdaya Samhitā, I xvi

- अथ ताल शब्देन प्रदेशं सूच्यते । एतेन एक ताल प्रदेशो यस्य तदेकताल, द्वे ताल प्रदेशौ यस्य तत् द्वितालकम्, एतेन मत्स्यस्य शल्कवत्प्रतनुमुखं र प्रदेश एकताल मत्स्यशल्कवत् प्रतनुमुखं द्विप्रदेशं द्वितालमित्युक्तम् । परिणामस्तु कर्णादिप्रवेशो ज्ञेयः । अन्ये तु मत्स्यतालकवर्षट्कतालकदितालके इति पठन्ति । व्याख्यानयन्ति च मत्स्यस्य भेटुनिमत्स्य, तस्य लोहमयतालकाकारं मुखं भवति अतस्तन्मुखार्त्ताकारं यन्त्रमेकतालकं, सर्व्वमुखार्त्ताकारं द्वितालकं, तालयोऽथअपवारकादिपाटसन्धिवन्धनं लोहमयसूच्यते ।

Dallana's Commentary, I vii

For removing substances that have fallen into the meatus auditorius, Paul says ¹ "They must therefore be extracted by an earpick, a hook, or tweezers, or by using powerful shaking of the head, while the ear is placed upon some circular board" Albucasis recommends us to use a slender forceps, which resembles the modern dissecting forceps. He also commends for the purpose a hook slightly bent, which is also mentioned by Celsus ²

IV. The Nāḍī Yantra or Tubular Instruments.

The Nāḍī or tubular instruments are described to be of various kinds and to serve many purposes ¹ They are open either at one or both ends. These are used for the extraction of foreign substances from the natural outlets of the body. They are also recommended to be used as a diagnostic apparatus for inspection of diseases in the canals. They are the means of sucking out fluid discharges, as pus *etc.*, from cavities and they facilitate the performances of other operations. They vary in length and diameter in proportion to the different sizes of the outer canals of the body, or according to the varieties of purposes to be served by them

¹ Paulus Ægineta, Vol II VI xxiv (Syd Soc Ed)

² Celsus, VI

³ नाडी यन्त्राण्यनेकप्रकाराण्यनेक प्रयोजनान्येकतो मुखान्युभयतो मुखानि च तानि स्त्रीती-
गतश्लेष्मीद्वारणाय रोगदर्शनार्थमाचूषणाय क्रियासीकायार्थाच्चेति तानि स्त्रीतद्वारपरिणामानि
यथायोग परिणामद्वौर्घोषि च ।

Suśruta Saṁhitā, I १११

नाडीयन्त्राणि शुषिराण्येकानेक मुखानि तु ।

स्त्रीतीगतानां श्लेष्मानामयानाञ्च दर्शने ।

क्रियाणां सुकरत्वाय कूर्थादाचूषणाय च ।

तद्विस्तार परिणामद्वौ स्त्रीतीऽनुरोधतः ॥ ८ ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I xxv.

The tubular instruments are used for fistula-in-ano, hæmorrhoids, tumours, abscesses, injections into the rectum, vagina and urethra, hydrocele, ascites, inhalations, stricture of urethra and rectum and cupping as by gourd and horns ¹

As examples of the tubular instruments, Vāgbhata II. mentions —

1 KANTHASALĀYANOKINI² OR THROAT SPECULUM

To examine foreign substances such as a fish-bone in the throat, the instrument should have a length of ten anguli and a circumference of five anguli

Suśruta describes the extraction of a foreign body, made of lac from the throat of a patient by the following device. A heated iron probe or sound should be introduced into the throat of a patient through a tube of copper and made to touch the bit of shellac. The foreign substance would begin to dissolve or soften and so will adhere to the probe. The rod is then to be cooled by sprinkling water through the tube and the foreign body then should be drawn out steadily with it ³. But other kinds of foreign bodies are to be extracted from the throat by means of a rod-like instrument, one end of which is smeared with melted wax or shellac.

The use of some adhesive substance for extraction of foreign bodies accidentally introduced into the outer passages of the

¹ भगन्दरार्गोर्द्व्यद्वन्नयवत्प्रागरवनिमूचहृदिदोदरधूमनिरुपप्रकाशसन्निवृत्तगुदयन्त्राण्य-
वायुमृदयन्त्राणि चोपरिदाष्टव्यामः ।

Suśruta Samhitā, I. viii

² दशान्दुर्लभादनात् कण्ठशल्यावलीकिनी ।

Aṣṭāṅga Hṛdaya, I. xxv.

³ ज्ञातुपे कण्ठासक्ते कण्ठे नाडी प्रवेग्याप्रितमाश्च शलाकां तथावगृह्य शीताभिरङ्घ्रि-
परिधिष्व स्थिरीभूतमुदरेत् । अज्ञातुष ज्ञानुसधूस्रिष्टमिमांश शलाकाया पूर्व्यकक्षपेनेत्येके ।

Suśruta Samhitā, I. xxviii.

human body was well known to the Greeks and Romans Paul says¹ "Stones and such like bodies we extract by wrapping wool round an earpick, and smearing it with turpentine-resin, or some glutinous substance, and introducing it gently into the *mentus auditorius*"

2 PAÑCAMUKHA AND TRIMUKHA

To take a good hold of a four-eared arrow, a speculum having five holes (PAÑCAMUKHA) should be had recourse to, and for a two-eared arrow, a speculum having three holes (TRIMUKHA) would be necessary. The central hole is for the arrow, while the side holes are meant for the ears of the arrow -

Celsus² says that when a weapon buried in the flesh has barbs too strong to be broken with forceps, they may be shielded with split writing-reeds (*Calamus scriptorium*), and the weapon thus withdrawn

Paul says "Some apply a tube round about the barbs³ so that when they draw out the weapon, the flesh may not be torn by the barbs"

In modern times a snare is used instead of a tube Dr. Erichsen⁴ writes "The extraction of an arrow is usually attended with little difficulty. But if barbed, special precautions have to be taken. With the view of safely effecting its removal, the snares have been devised"

¹ Paulus Ægineta Vol II VI 1111 (Syd Soc Ed)

² नाडीपद्ममुखच्छिद्रा चतुष्कर्णस्य सग्रहे ।

वारङ्गस्य द्विकर्णस्य त्रिच्छिद्रा तत् प्रमाणम् ।

Astānga Hṛdaya, I 111

³ Celsus vii v

⁴ The Works of Paulus Ægineta vi 111111

⁵ The Science and Art of Surgery Vol I pp 343

3 TUBULAR INSTRUMENTS FOR INSPECTION OF ARROWS

Again for the inspection of the arrows, various kinds of tubular instruments would be necessary, which will vary according to the shape, length, and circumference of the arrows and their ends¹

1 ŚALYANIRGHĀTANĪ

The top of this tubular instrument is shaped like the disc of a lotus and is closed. The other end is open and leads to a hollow extending to a fourth part of the tube. It has a length of twelve anguli. It is useful for removing an arrow fixed deeply into the body, in different directions and thus helping its easy extraction. For this purpose Suśruta directs us to use a stone hammer.

The Śalyanirghātani had its counterpart in the female part of the Impellent, mentioned by Paul, for forcing an arrowhead forwards through a part so as to extract it at the side opposite to that of its entrance. It would thus be seen that the function of the Impellent was similar to that of the Śalyanirghātani, the former moved it forwards, while the latter moved the śalya side to side, the object of both being to extract the foreign substance. The Impellent would seem to have been a plain rod of metal pointed at one end (the male part) and hollowed at the other (the female part) the pointed end used to be introduced into the socket of an arrow when it possessed one, and the hollow

¹ वारुह कर्णमस्थान नादं दर्शयितुमीधत ।

नाडीरेवं विधाशान्या द्रष्टुं शक्याणि कारयेत् ॥ १० ॥

Astānga Hrdaya, I xxv

- पद्मकर्णिकया मृत्तिं सहशी वादशाहुना ।

चतुर्थं शुषिरानाडी शल्यनिर्घातनी मता ॥

end was meant to fit over the tail in case where the arrow was tanged¹ The Greeks and Romans recognised the necessity of an arrow being moved about until loosened, if it remained fixed in the bone, and Celsus directs us to strike it with some non instrument until it be shaken from the place where it is lodged

5 TUBULAR INSTRUMENTS FOR PILES

According to Suśruta² these should be made either of iron, or ivory, or horn or wood They are hollow instruments tapering at the end which should be shaped like the teat of a cow For males, the length is four anguli, while the circumference is five anguli In the case of females, however, the tube should be made wider, the circumference being six anguli, and longer, the length being equal to the space covered by the palm of the hand There are two slits on the sides—one for inspection of diseases and the other to allow application of caustic and cautery to the diseased part The slit measures three anguli in length and the pulp of the thumb in breadth At a distance of a half anguli from the margin of the slit, is raised a circular projection, also a half anguli high

¹ Paulus Ægineta, VI lxxxviii

² Celsus, VII 5

³ तत्र यन्त्रं लोहं दान्तं शार्ङ्गं वार्धं वा गोस्तनाकारं चतुराङ्गुलायतं पञ्चाङ्गुलपरिणाहं पुंसां षडङ्गुलपरिणाहं नारीणां तलायतं तद्वक्षिच्छिद्रं दर्शनार्थमेकं छिद्रमेकं छिद्रान्तु कर्मणि । एकद्वारे हि शस्त्रचाराग्नीनामतिक्रमो न भवति । छिद्रप्रमाणान्तु चतुराङ्गुलायतमङ्गुलीदरपरिणाहं यदङ्गुलमवशिष्टं तस्याष्टाङ्गुलमधस्तादष्टाङ्गुलीच्छित्तोपरिष्ठत्कर्णिकमपयन्नाकृतिः समाप्तः ।

Vāgbhata¹ describes two different instruments one for inspection and the other for medication. They both have the same length and circumference. The former has two slits on the side, while the latter has only one slit, three anguli long and the pulp of the thumb in width. The annular projection is turned upwards, the object being the prevention of sudden introduction of the instrument too far inside.

A similar instrument without any slit on the side is called Śamī. It is said to be used for exerting pressure over the pole by its introduction into the rectum (Vāgbhata).

Rectal speculum is mentioned by Hippocrates in his treatise on fistula and by Paul in the treatment of piles.² It is called CLOPTER in contradistinction to the vaginal speculum which is called DIOPTER. The rectal speculum in the Naples museum is a two-bladed instrument working with a hinge in the middle. In modern times, both the varieties of the speculum, tubular and valved, are in use.

For inspection and medication of piles a tubular speculum is recommended to be used by the veterinary surgeons. In the

¹ अङ्गुलीयान्तराकारं यन्त्रं चतुर्द्वयम् ।

नारं पञ्चद्वयम् पुनरङ्गुलीयान्तरा पञ्चद्वयम् ।

दिशिष्टं द्वयं च व्यभिचिकषिद्रन्तु कर्माणि ।

स येन चतुर्द्वयान्तराद्विन्दन् विन्दन्तम् ।

पञ्चद्वयान्तराद्विन्दन् कर्माणि च चतुर्द्वयम् ॥

Artinga Hrdaya Samhitā, I xxx

- गद्याद्यां तादृग्दिष्टं यन्त्रमङ्गं प्रपीनम् ॥ १३ ॥

Ibid

² The Genuine Works of Hippocrates. (Syd Soc Ed.) Vol II P 317

³ Paulus Aegineta, VI lxxix

Aśvavaidyaka, Jayadatta sūn¹ describes the instrument thus
 "The surgeon should know the instrument to have the length of six anguli. On the two sides, the wise surgeon should make two slits, three anguli long and a half anguli broad. Through an instrument with two slits, the piles of the horses should be examined. Through a speculum with one slit, the surgical operations, such as incisions &c., should be performed, after having tied the horse and making him lie down"

6 TUBULAR INSTRUMENTS FOR FISTULA-IN-ANO

These are similar to the instruments used for the inspection and medication of piles, the only difference being the omission of the circular rings in their construction, for otherwise, the projection may rub over the sore if the speculum be introduced deeply.²

¹ यन्त्रं षडङ्गुलं विद्वान् छिद्रं पञ्चाङ्गुलं भिषक् ।

अधोऽर्द्धाङ्गुलाविस्तीर्णं देख्येणाप्यङ्गुलतयम् ॥

उभयोः पार्श्वयोस्तस्य कुर्याच्छिद्रद्वयं बुध ।

अर्गस्तेन तु बाह्यस्य द्विच्छिद्रेण विलोकयेत् ॥

एकच्छिद्रेण वै कर्म कुर्याच्छेदादि पूर्वकम् ।

पातितस्य सुवहस्य तुरङ्गस्य विचक्षणः ॥

Aśvavaidyaka (Bibliotheca Indica) LIII १८ 4, 5 and 6

² छिद्रादूर्ध्वं हरेदीष्टमर्गयन्त्रस्य यन्त्रवित ।

ततो भगन्दरे दद्यादेतदहोन्दु सन्निभ ॥

Suśruta Samhitā, IV १११

सञ्चयाऽपनयेदीष्टं छिद्रादूर्ध्वं भगन्दरे ।

Aṣṭāṅga Hīdaya, I. १११

7. TUBULAR INSTRUMENTS FOR THE NOSE.

Nasal-Speculum

Similar tubular instrument without ring is to be used for examination of nasal diseases as tumours and polypus. It is however shorter and thinner than the rectal speculum. Vāgbhata says "It is two angulī long and admits the index finger in its lumen. The tube has a single slit on the side"¹

He describes nasal tubes for introducing medicated powders into the nose as snuff². After partially filling the tube with powders, one should blow through the empty end, the other end being put well inside the nasal cavity. Suśruta also uses a tube to blow powder into the nose³. Caraka⁴ mentions nasal insufflation to cure diseases. Śārṅgadharā⁵ and Cakradatta⁶ describe the nasal tube for insufflation to be six angulī long and open at both ends.

¹ घ्राणार्न्वदार्शसामेकच्छिद्रा नाद्याऽङ्गुलद्वया ।

प्रदेशिनी परिष्णाहा स्याद्गन्धर यन्त्रवत् ॥ १५ ॥

Aṣṭāṅga Hṛdaya, I ११८.

² धानं विरेचनधूर्णो युञ्ज्यात् तं मुखवायुना ।

षडङ्गुलद्विमुखया नाद्या भेषजगर्भया ।

Ibid. I ११

³ नासास्त्रावे घ्राणतथूर्णमुक्त्वा नाद्यादेय योऽवपीडयतीक्ष्णः ।

Suśruta Samhitā, VI ११११

⁴ सिद्धिं स्थान्नाशनं चूर्णश्लेषा प्रथमणे हित ।

Caraka Samhitā, VI ११८१.

⁵ षडङ्गुला दिवक्त्रा या नाडी चूर्णान्तयो धमेत् ।

तीक्ष्ण कोलमितम्बक्त्र वाते प्रथमन हित ॥

Śārṅgadharā Samgraha, III ११११.

⁶ धापनं रेचनधूर्णो युञ्ज्यात् तत् मुखवायुना ।

षडङ्गुल द्विमुखया नाद्या भेषजगर्भया ॥

Cakradatta, Nasyādihikāra

Aretaeus says that a quill or reed or a wide long tube may be used for blowing powders into the pharynx. Alexander Trallianus² says that a *calamus scriptorium*, the joints of which have been removed, may be used as an insufflator. Oribasius³ however gives the fullest description of the tube used as a nasal insufflator. "A reed slender and with a straight bore, 6 inches in length, and of such a size that it can be passed in the nares, is taken and its cavity entirely filled with medicament. The reed may be either natural or of bronze. This being placed in the nares, we propel the medicament by blowing into the other end."

In modern times we advise our patients to do the same thing when powders are prescribed to be thrown into the nose or ears. The cylindrical shaft of the ordinary quill so cut as to be open at both ends will serve the purpose admirably. The nasal insufflator is used now for identical object.

Aretaeus⁴ mentions a nasal syringe with a double tube. It consists of two pipes united together by an outlet so that liquid medicine may be injected into both the nasal cavities simultaneously, for injection into each nostril separately, he points out, can not be borne.

It is remarkable that in *Mahāvāgga*⁵ mention is made of single and double nose-spoons. *Nāthu-karani* (i.e., an instrument to hold up the nose, so that the medicated oil

¹ Aretaeus, Vol. II, P. 408

² Alexander Trallianus, IV. viii

³ Oribasius Collect, vii

⁴ Aretaeus, Ed. Adams, Vol. II, P. 459

⁵ *Mahāvāgga*, VI. 13. 1 & 2. Sacred Books of the East

does not run out Ed) and Yamaka-nāthu-karani (*i.e.*, one that would go up both nostrils Ed) They are recommended to be made of gold, or silver, or bone, or ivory, or horn, or of the *nala* reed, or of bambu, or of wood, or of lac, or of the shells of fruit, or of chank-shell" (Sacred Books of the East).

To apply oily medicines inside the nasal cavity a cotton wick is first soaked in the oil and then it is pushed well inside the nose It is recommended also to pour oil into the cavity through a tube, while the other cavity is pressed by a finger (Vāgbhata¹)

To treat a case of fracture of the nasal bones, Suśruta recommends² two straight tubes open at both ends to be introduced into the nasal cavities, after putting the fractured ends in position, either lowering or elevating the raised or depressed end by a rod as required Then bandages are to be applied The tubes serve as splints to support the broken ends in position, while through them orifices the patient may breathe without inconvenience

Similarly Celsus, after replacing the fractured ends in position uses oblong tents sewed round with a thin soft skin as splints into the nostrils, or a large quill smeared with gum, or artificer's glue may be applied in the same way Paul also

¹ नासापुट पिपायेक पर्यायेण निषेचयेत् ।

उष्णास्तु भेषज्य प्रनाद्या पितुनाऽथवा ॥

Aṣṭāṅga Hrdaya, I २८

² नासा सन्ना विहत्ता वा ऋज्वी कृत्वा शलाकया ।

पृथग् नासिकयोनाद्यौ द्विमुखौ सप्रवेशयेत् ॥

ततः पट्टेन संवेष्ट्य घृतसेकं प्रदापयेत् ॥

Suśruta Samhitā, VI. 111

says "And some sew the quills of the leathers of a goose into the rings, and thus introduce them into the nose, in order that they may preserve the parts in position without obstructing the respiration, but this is unnecessary as respiration is carried on by the mouth"¹

Suśruta also advises us to introduce these tubes into the nasal cavities during the performance of the Rhinoplastic operations²

8 THE ANGULI-TPĀKA OF FINGER-GUARD

Vāgbhata says³ "It is generally made either of ivory or wood. The instrument is shaped like the teat of a cow, and is four anguli long. Two slits occur on the sides like those in the speculum for piles."

It protects the finger of the surgeon from being injured by the teeth of the patient and so helps the surgeon in opening the mouth of the patient with ease⁴

In modern times, finger-guards are used for the same purposes

¹ Paulus Aegineta, Vol II. vi, xvi Syd Soc Ed

² सुस्रुत सम्यगथो यथावम्राङ्गीहयेनाभिसमीचा वज्रा ।

मोक्षस्य चेनामवचूर्णयेत् पक्ष्मयष्टीमधुकाञ्चनैः ॥

Suśruta Samhitā, I २११

³ अङ्गुलिचाणकं दान्तं वाचं वा चतुरङ्गुलम् ।

हिक्किद्र गोक्षनाकारं तद्वक्त्रविहतीमुख ॥

Aṣṭāṅga Hṛdaya, I २२१

⁴ तस्य वक्त्रं विहती, सम्भृतं मुखस्यातुरस्य मुखव्यादानं निमित्तं सुखं सुखकरं स्यात् ।
यत इदं दन्तघातात् रचति अस्य उक्तं सुखमिति ।

Vāgbhatārtha Kaumudī, I २२१.

अङ्गुलिर्दन्तेभ्यो रक्षणार्थत्वादङ्गुलिचाणमिति नाम ।

Sarvāṅga Sundarī, I २२१

9 JONI-VANLEKSANA OR VAGINAL SPECULUM

Vāgbhata¹ describes it to be a tubular instrument, sixteen anguli long, and six anguli in circumference. It consists of four blades, attached at their bases to a ring. The tube tapers gradually, the end is free and looks like the bud of a lotus. To the four blades are soldered four rods in such a way that on pressing their free ends, which pass out of the ring, by the surgeon's hands, the tapering end of the tube would gape widely. The surgeon by regulating the pressure of his hand, may open or close the speculum to any desired extent.

Another kind of vaginal speculum used to be manufactured out of the two horns of a buffalo by dividing each into two longitudinal halves. They should be so paired that their concave surfaces would look towards one another, their ends diverging outwards. So we get a pair of bivalve speculum out of a pair of horns.

The bivalve speculum of horn mentioned above, has its modern counterpart in the pair of speculum known as Baine's or Neugebauer's speculum.

¹ योनिद्वलेक्षण मध्ये शुषिर षोडशाङ्गुलम् ।

मुद्रावह चतुर्भिश्चसम्पीज सुकुलानन ।

चतुःशलाकमाक्रान्त मूले तद्विकसेन्मुखि ॥ १० ।

Asṭāṅga Hrdaya, I १११

अस्य यन्त्रस्य कम्पनाया चत्वारिखण्डानि तथा कार्याणि यथा मुद्रिकया वज्रानि मिलितानि च पद्मसुकुलाकारं मुखं, अन्तरं शुषिरं षोडशङ्गुलं परिणादवती नास्तीत्यात् । ततस्तन्मध्ये प्रत्येकं खण्डसंलग्नं चतस्रं शलाका आसुखात् सन्निवेश्य शलाकानामध्यभागे तथा वधीयात् यथा शलाकामूलं षोडशेन यन्त्रस्य मुखं विकसेत् ।

The vaginal speculum or Diopter is mentioned by Soranus, Paul¹ and other Greek surgeons. Paul describes its method of working as follows — "The person using the speculum should measure with a probe the depth of the woman's vagina, lest the stalk (istula) of the speculum being too long, it should happen that the uterus should be pressed upon. If it be ascertained that the stalk is larger than the vagina, folded compresses are to be laid on the alæ pudendi, in order that the speculum may be placed upon them. The stalk is to be introduced, having a screw at the upper part, and the speculum is to be held by the operator, but the screw is to be turned by the assistant, so that the laminae of the stalk being separated, the vagina may be distended." The accounts given by Albucasis² and Haly Abbas³ are similar. These instruments are described to be bivalve, trivalve or quadrivalve. A quadrivalve speculum of the Greeks is identical with the Jom-vanekşana of the Hindus, the only difference being that the former is acted by screw mechanism, while the latter is worked on the principle of the lever. Drawings of several sorts of the Greek instruments are given in the surgery of Albucasis and by Schultet⁴. There are three specimens of vaginal speculum in the Naples museum, drawings of which are given by Milne. In modern times, we use similar valvular speculum for identical purposes.

¹ Paulus Aegineta, Vol II vi lxxiii Syd Soc Ed

² Albucasis, Chirrug, II 71.

³ Haly Abbas, Pinet ix 57.

⁴ Arsenal de chirrug tab 18

10. TUBULAR INSTRUMENTS FOR WOUNDS

Vrana-vasti or Wound-sringe

If the wound be caused by deranged m and be very tender, especially if it forms on the lower half of the body, the vasti should be used. In diseases of the urinary organs, such as, obstruction of urine, faulty conditions of urine, impure semen, stone in the bladder and disorders of menstruation, uttara-vasti is necessary.¹

There are two instruments mentioned—one for application of oleaginous medicines to a sore and the other for washing a sinus with medicated lotions. Each consists of a tube and a leather bag. The tube is smooth and rounded and is shaped like a cow's tail.² It is six anguli long. The base is broad and admits a thumb, while the end is narrow and admits a pea. There is a circular projection or ring at a short distance from the end. The base is fitted tightly into a bag of thin leather.³

- ¹ वतितृष्टीं मणोरम्यं रुचायत्वर्थवेदन ।
 ऋधं कृतिं विशिष्टं तत्र वस्त्रिधिधीयते ।
 मृयाघानं मृतदोषं यद्वर्ण्येऽग्रमरोत्तमं ।
 तथैवार्धवेदोपे च वस्त्रिष्टुत्तमे स्थिते ॥

Susruta Samhitā, IV, 1

² नाडीं मृणानां खलप्रयोगार्थं प्रचालनार्थं च यन्त्रं आच यन्त्रे इत्यादि नाडीत्रणाम्यङ्गं
 चाननाय नाडीत्रणानामभ्यर्थं प्रचालनार्थं च षडङ्गं षडङ्गं दोषैः, वस्त्रियन्त्राकृतिं वस्त्रि-
 नेवाकारं नने गोपुच्छाकारं " " " " "

Vāgbhatāṭhā Kūmudī, I, xxx

- ³ यन्त्रनाडीं त्रणाम्यङ्गं चाननाय षडङ्गं ।
 वस्त्रियन्त्राकृतो मूर्त्तऽङ्गुष्ठं कर्मायम् ।
 अयत्तं कर्म्मिकं मूलं त्रिपुण्ड्रचक्षुषी ॥ १८ ।

Aśāṅga Hidayā Samhitā, I, xxx

To prevent the tube slipping out of the bag, an additional precaution is taken by tying a knot of thread over the leather covering the tube. For description of the bag, *vide infra*.

Śrīṅgadhara¹ however says that the tube should have the thickness of the shaft of a vulture's feather and should admit a moong (Phaseolus Moong). It is eight anguli long.

Pālikāpya describes the tube for washing wounds of elephants to be made of copper, and shaped like the knoutika flower. It is sixteen anguli long.

In modern times, wound syringes are similarly used to wash the sore with medicated lotions.

For description of the tubes for vāra-dhūpani or wound-fumigation, *vide infra*.

II. TUBULAR INSTRUMENTS FOR ASCITES

Dākodara yantra or Canula

It may be either metallic or manufactured from the cylindrical hollow calamus of a peacock's feather.² The tube is open at both ends and is of the same calibre throughout. Suśruta advises us to use a pipe of tin, or lead or a feather to drain the fluid, after the abdomen has been tapped.³

¹ व्रणवस्त्रेनैतं नैतं स्यात् यन्नामघातशूलोन्मितम् ।

मुद्गच्छिद्रग्रन्थपचननिकापरिणामि च ।

Śrīṅgadhara Saṅgraha, III. vi

² द्विदारा ननिका पिच्छननिका वा दाकोदरे । १६ ।

Aśtāṅga Hīdava Samhitā, I. xvi

³ ततः तृणादीनामन्यतमस्य नाडीद्विदारा पचनाङ्गी वा सद्योज्या दीप्योदक-
भवसिञ्चेत्ततो नाडीसपरित्यक्तैर्गन्धवर्गेनाभ्यङ्ग्य व्रणवस्त्रेनोपचरेत् ।

Suśruta Samhitā, IV. xiv

Celsus describes a lead or copper canula for draining ascites ¹ Paul writes that the tip used to be bevelled off like a writing pen - It was also employed in empyema ² Albucasis ³ mentions a tube of silver or copper or brass having a small hole at the bottom and three on its sides

In modern times we use a metallic canula of similar shape for draining fluid in ascites

12 TUBULAR INSTRUMENTS FOR HYDROCELE

This is practically the same instrument described above Suśruta mentions a tube or canula to drain the fluid after tapping the hydrocele with the viñhumukha śastra or trocar The Greek surgeons did not describe the operation They preferred the open incision to puncture ⁴ Rhases, however, describes the operation of puncturing the scrotum for hydrocele ⁵

13 TUBULAR INSTRUMENTS FOR URETHRAL STRICTURE

Suśruta recommends gradual mechanical dilatation of the urethra by means of tubes made of iron, or wood, or lac, well-smeared

¹ Celsus, vii 15 & ii 10

² Paulus Aegineta Vol II VI L Syd Soc Ed

³ Hippocrates, ii 259

⁴ Albucasis, Chirurg, ii 51

सूत्रज्ञा स्वेदयित्वा तु यन्त्रपट्रेन वेष्टयेत् ॥

मेवम्या पार्थ तोऽधस्तादिधिघ्नीहिमुनि च ।

अथाव हिमुखा नाडी दत्वा विस्वावयेद् भिषक् ॥

Suśruta Samhitā, IV xix

⁵ Paulus Aegineta, VI lxi

Rhases, Cont xxix

with ghee.¹ He advises us to use the same tube for three consecutive days, then another of larger calibre for three days more, and so on, till the canal be fully dilated. He reserves External Perithotomy as a last resource.

II. TUBULAR INSTRUMENTS FOR RECTAL STRICTURE

Susruta similarly describes gradual dilatation of stricture of the rectum, using a higher number of dilators after the lapse of three days until the desired effect is attained.

¹ (a) निरुद्धप्रकाशे नाडीं श्लेष्मासृग्मसोमसुर्वी ।

दारुणा वा जलक्षता जलाभ्यां प्रवेष्टव्यं ।

परिप्लव्यं यमामयं शिथिलारुणं च ॥

भजते तदाग्रेण नातं प्रथमद्वयं ।

मृदाद्यानं मृत्प्लवगं मृत्प्लवगं प्रवेष्टव्यं ।

श्लेष्मोविण्मृद्वेद्यं शिथिलमयं भोज्यम् ।

भित्तिना सेवनां मुना मय अतएवाचरेत् ॥

Susruta Samhitā IV. 22

(b) निरुद्ध प्रकाशे नाडीं हिमुन्नाम कनकादिनाम् ।

निष्ठाभ्यां जलकादिभ्यश्च परिधिचरेत् ।

तैलनं वा वचदारुकर्मुषं सिद्धं च तदात् ॥

पुन मृत्प्लवगं नाडीद्वयां श्लेष्मोविण्मृद्वेद्यं ।

मृद्वेद्यं च क्रियाक्रमः ॥

Calradatta, Kusumārā Cikitsā

See also Yogaratnākara, P. 108, where these verses are quoted

* See I (a) अम्यार्थं —सेवनां त्यक्त्वा शस्त्रेण वा सूत्रसोतं सक्रीचकारणं चम विदारयेत् । तस्यापि दारुणाविपाटे मणिशरमथ्येव दारवेदिति ।

Commentary of Śrī Kantha in Vyākhyā Kusumārā
(Anandāsram Series) P. 106

² मन्त्रिकुट्टं गुटे श्लेष्मा निरुद्धप्रकाशक्रिया ॥

Susruta Samhitā IV. 22

There is no mention of solid bladder sounds in the Sanskrit medical books. But from the above descriptions it seems beyond doubt that they had a set of dilators for structure of the urethra and another set of dilators for structure of the rectum. These dilators were tubes—either metallic or wooden—and had a regular gradation in the increase of their diameters. Cakrapāṇi mentions structure dilators of gold.¹

In modern times we have also two sets of these instruments—urethral and rectal dilators, numbered in an ascending series according to the increased diameters of these instruments.

15. TUBULAR INSTRUMENTS FOR INJECTIONS INTO THE RECTUM

Vastivāntri or Rectal Clyster

Injections into the rectum are to be thrown by means of a tube with a membranous bag tied to its end. The tube is advised to be made either of gold, or silver, or lead, or copper, or brass, or bell-metal, or ivory, or horns, or glass, or precious stones, or wood or bamboo. It should be clean, smooth, strong, and tapering-like a cow's tail, and should terminate in a smooth rounded bulb. The tube varies in length and circumference according to the age of the patient as follows—

I. Caraka²

| Age | Length of tube | Opening at the end admits |
|---------------|----------------|---------------------------|
| 6 years | 6 angul | A moong |
| 12 " | 8 " | A pea |
| 20 " and over | 12 " | A small plum seed |

¹ See foot note 1 (b), Page 124

- स्वर्णरुध्यत्रपुतासरीति

कास्याग्रमास्थिद्रुमवेणुदन्ते ।

ननेर्विषाणैर्मणिभित्तये तेभ्ये

कार्याणि नेत्राणि मुकर्णिकानि ॥

II Suśruta¹

| Age | Length of tube | Part of tube in use | Circumference of tube | Circumference at end | Measure of injection |
|--------|-------------------------------|---------------------|-----------------------|----------------------------|----------------------|
| 1 year | 6 anjali | 1 anjali | Little finger | Shaft of heron's feather | 2 āṅgula |
| 8 " | 8 " | 2 " | Wh | Shaft of falcon's feather | 4 " |
| 16 " | 10 " | 3 " | Ind | Shaft of peacock's feather | 6 " |
| 50 | 12 | 4 | Pulp of thumb | Alumina aplam | 12 |
| 70 | Same as that of the 16th year | | | | |

दण्डादष्टाष्टाङ्गुलं सगित्तानि यन्निस्सिद्धादष्टाष्टाङ्गुलानाम् ।
 सुमृष्टकर्मसु मत्तोत्तानिभिन्नाणि यन्नापिस्तानि चापि ॥
 यथायथोऽष्टाङ्गुलं कनिष्ठिकाया मूलमयो मृ पश्चिन्नाष्टाङ्गुलम् ।
 सप्तानि सौषण्डसमास्त्योनि यन्नापि च सुमृष्टिन्नाष्टाङ्गुलानि ॥
 म्याम् कर्णिकेकाय चतुर्थभागे म्याग्निने यन्नि निषमने च ।
 शस्त्रोत्तानि यन्नापि वा म्याग्निने यन्नि निषमने चापि ॥
 दण्डमन्त्रिणो गिरि कपायस्तु मृष्ट मग्न ।
 मग्न तयोयोला यन्नाष्टाष्टाङ्गुलं नैवेष्टु योग्यता मुवचमुच ॥

Caraka Samhitā, VIII m

Also quoted in Cakradatta, Anuvāsanādhikāra

१ तत्र मायुस्मरिकाटस्त्रिष्ट यथांता यष्टदण्डाष्टाङ्गुल प्रमाणानि कनिष्ठिकानामिका मध्यमा
 णि परिणालागमेऽष्टाष्टाङ्गुलाः ततोऽष्टाष्टाङ्गुलं मन्त्रिष्ट कर्णिकानि कदम्बेन बहिर्षव नाडी
 त्वय प्रवेगानि सुदमायकलायमाय सौतामि विदध्याग्रेषाणि तेषु त्वास्यापनाद्वय प्रमाणमातुर
 रम्भमग्निनेन प्रसनेन सगित्तो प्रसतो दण्डत्वाग्रेऽष्टो विधेया ।

भवति चाप ।

यद्येकस्मिन् नेत्राणा बलिमानस्य चैव च ।

यद्येकस्मिन्नेत्राणि समीक्ष्य वदयेद्विधि ॥

पञ्चविंशतेश्च दण्डाष्टाष्टाङ्गुलं मन्त्रिष्ट दण्डोदर परिणालागमे कनिष्ठिकोदर परिणालागमे त्वाष्टाष्टाङ्गुल
 मन्त्रिष्ट कर्णिकं दण्डपचनाडीतुल्य प्रवेग कोलास्थिमात्रं चिद्वर किन्नकलाप्रमात्रं चिद्वरमित्येके ।
 मन्त्रानि मन्त्रिष्ट बलिनिषमने च दिकर्णिकानि । आस्थापनं द्रव्य प्रमाणं तु विहितं दण्डाष्टाष्टाङ्गुलं प्रसता ।
 मन्त्रेभ्यो नैव प्रमाणमेतदेव द्रव्य प्रमाणं तु द्विरष्टवर्षवत् ।

तत्र नेत्राणि स्वर्णं रजतमाशयोरीति दन्तग्रन्थमणितरुसारमग्नानि यन्नापि दण्डानि
 गोपुष्पाक्षतीक्ष्णानि गटिका मुखानि । वस्तुयाष्टाष्टाङ्गुलाना मृद्वो नाति बहला दण्डा प्रमाणवन्तो
 गोमस्त्रिष्टवराज्ञाजीरमाणा ।

III. Vāgbhata II ¹

| Age (years) | Length of tube | Opening at base admits | Opening at end admits |
|-------------|---|------------------------|-----------------------------------|
| Under 1 | 5 angul | 1 finger | A moong (phaseolus moong) |
| 1 to 6 | 6 | 1 1/2 " | A masha (phaseolous Rox) |
| 7 to 11 | 8 | 2 | A kalāva (pea) (pinus sativum) |
| 12 to 15 | 9 | 2 1/2 | Boiled pea |
| 16 to 20 | 12 | 3 | A sagalakoli (zizy plus cenoplia) |
| over 20 | varies according to the age strength and size of the patient, but the orifice at the base of the tube need not be wider | | |

नेत्रमग्निं शितनाडी नलनशम्यि सभवा ।

वन्तानां शित चम सभ वा तान्त्र धनम् ॥

वन्नि निरुपदिशन्तु गद सपरिमाजित ।

सदनुत रानज सृ खे विसर्द्धित ।

नेत्रमग्निं प्रतिपाद्य नुननु विवताननम् ॥

Susruta Samhitā, IV xxxv

¹ तयोम् नेत्रं शमादि धातु दार्ढ्यस्यि वेनुज ।

गोपच्छाकारमच्छिद्र यन्त्रं गुडिका मुख ॥

ऊर्ध्वं पञ्चप्रणै, गिरामनभ्योऽङ्गुलानि पट् ।

मनसै मन ताव्यर्धं द्वादशे षोडशे नव ।

द्वादशे पर विंशद वीचा वर्पान्तरेषु च ।

वयो वल शरीराणि प्रमाणमभिवर्धित ॥

साहस्रेण समसृजि स्थीत्येनाये कनिष्ठ्या ॥

प्रणैऽन्तेऽङ्गुल मादाय तदुदाह प्रवर्तित ।

चाङ्गुल परम छिद्र सृजिष्ये वदने तु यत ।

सुह माप कलायन्तु स्विन्न कर्कशुक क्रमात् ॥

• सल छिद्र प्रमाणेन प्रान्ते घटित कर्णिक ।

वत्याय विहित सृजि यथास्व चाङ्गुलान्तर ।

कर्णिका द्वितय नेत्रे कुप्यात तत्र च योजयेत् ॥

प्रजावि सन्निपादोना वन्नि समुद्रित दृढ ।

कपाय रक्त निच्छिद्र यन्त्रि गन्ध गिर तनु ।

यथित साधुसूतेण सुख सस्याप्य भिषज ।

वन्तानां शितेऽङ्गुपाद वा न्यसेद्वासोऽथवा घन ॥

Aṅgira Hṛdaya Samhitā, I xiv

Cakradatta¹, Śaṅgadhara and Bhāva Miśra follow Cūraka as regards measurement. Kharanātha also gives a similar description

¹ See foot-note 2 Page 125

नेत्रं कण्ठं मृत्पाण्डिभासुभिश्चरुदंष्ट्रिभिः ।
 मन्त्रैर्भविष्यान्मर्मेभिर्मन्त्रिभिः । ॥
 एतत्पञ्च यन्त्रं यथास्मात् यन्त्रं ह्यम् ।
 तत्रा दातव्यं यथास्मान् स्यादष्टममितम् ॥
 ततः परं दातुमिच्छन्मर्मेभ्योऽर्पयता ।
 मृत्पाणिं यन्त्रं कृत्वा कौम्यम्विमिश्रितम् ॥
 गोपुष्पं मन्त्रिभ्यः सर्वं स्यूय तस्मात् क्रमात् यथा ।
 यथासक्तं भवेद्भयं यथा गोपुष्पं मन्त्रिभ्यः ॥
 आसुराह्वयमानेन सर्वं स्यूय विधीयते ।
 कनान्त्रिकापरिणासं च मृत्पाणिं मन्त्रिभिः ॥
 तन्मन्त्रं कर्त्तव्यं यथा कर्त्तव्यं भागावतुर्द्वयम् ।
 योजयेत् तत्र वल्मिश्रं यन्त्रं यथाविधा ततः ॥
 मृत्पाण्डिभ्यः कण्ठं मन्त्रिभ्यः पाणिं च भवेत् ।
 भयकोशं यन्त्रं तदन्त्यं च चन्द्रमणं ॥
 कषायकं मृत्पाण्डिभ्यः सिन्धुं दृष्टोत्तमम् ।
 व्रणयन्मन्त्रं नेत्रं मृत्पाण्डिभ्यः सिन्धुं दृष्टोत्तमम् ॥
 मृत्पाण्डिभ्यः पञ्चपलनिकापरिणासं च ।

Śaṅgadhara Samgraha III v

Bhāva Prākāśa I ii

¹ वल्मिश्रं यन्त्रं यथा मृत्पाण्डिभ्यः कण्ठं ।
 भवेद्गोपुष्पं मन्त्रिभ्यः मृत्पाणिं च कर्त्तव्यम् ।
 या विभागप्रणयने मृत्पाण्डि कर्त्तव्यं भवेत् ।
 द्वे कर्त्तव्ये चोपगृह्यतां हस्तधारिण्यवन्तरे ।
 माहृष्टकपरीणाहं मूलं नेत्रं च शक्यते ।
 मध्यं त्वनामिकातुल्यं च त्वन्यकनिष्ठिकं ।
 स्वेनाहृष्टं प्रमाणेन देयं स्याद् दातव्यमाहृष्टम् ।
 कर्त्तव्यं प्रवक्ष्ये च श्रेष्ठमन्यथावयवम् ।

Hārīta¹ advises us to use a bamboo tube four anguli long, which is to be introduced into the rectum up to two anguli

As a general rule, Caraka writes that the broad and the narrow ends of the tube are to be equal to the patient's thumb and little finger respectively, in circumference. The orifice at the end of the tube is to be kept closed by a wick, so that no foreign body may enter the lumen of the tube to occlude it. The plug may be easily removed when the tube is required for use, and then replaced.

Towards the narrow end of the tube is a projection or ring at a distance of about two anguli from the extremity. The height of the projection varies with the size of the tube at the base. It acts as a bar to the further introduction of the tube inside the rectum than required. Towards the base are two similar projections, two anguli apart from each other. To the one near the base is firmly tied the leather bag, so that the tube may not slip away suddenly during forcible compression of the bag. The other is meant to afford a firm grasp by the surgeon, so that the tube may not move during its introduction into the rectum. These projections are to be made of thread or a piece of cloth and are to be so shaped as to resemble the end of the proboscis of an elephant.

As regards the leather bags, they are recommended to be

विशद्वादशपञ्चवर्षे द्वादशपञ्चद्विगुलम् ।

कर्कशं सतीनायमुखं विद्रवहम् ॥

Khariānāda quoted in Śaṅkara's Sundarī, I 212

¹ चतुरङ्गुला त्रैशुभयो नाडी प्रतिलक्षणं कृत्वा त्वया वसिप्रतिकर्म कुर्वीत । * * *

गुदाभ्यन्तरे द्वादशगुलमात्रं नाडी सञ्चारयेत् सुधी ।

Hārīta Samhitā, V 111.

made of the bladder of cows, or buffaloes, or hogs, or goats, or lambs. The bladder is to be well cleaned first with lime and water, so that no unpleasant smell may be emitted by the decomposition of its muscular tissue, then dyed red with *Māñjīsthā* (*Rubia Cordifoliatum*) or with *Haritīkī* (*Terminalia Chebula*, Retz.) and thoroughly dried. The bags are recommended to be soft, durable, entire and capacious. If the bladders of these animals are not available, the bags are to be manufactured from a frog's skin, or the peritoneum (one-fourth part would suffice) of any beast, or a piece of leather or a piece of very thick cloth. The size of the bag varies according to the age of the patient. It is to be firmly tied over the first projection at the base of the tube.

In the *Siddhasthāna* Chapter XI of the *Caraka Saṃhitā*,¹ there is a passage showing that veterinary medicine was well-known to the ancient Hindus at a very early period. This portion was edited by Dīdhyavalu and it is impossible to decide whether the passage refers to *Āgneyasāntara* or not. It runs as follows — “Then the disciples asked — ‘How are clysters to be made in cases of animals such as elephants, camels, cows, horses, lambs and goats?’ To this, the sage Ātreya explained the clysters for

¹ अष्टचर्द्रेण सचवन्मिस्रयोत् विधिस्तस्याह पुन प्रचोदित ।
 अजाधिकेर्मास्य गजोष्ट्रयोवा गवाश्वयोर्वन्मिस्रान्तिमारुपम् ॥
 अजाधिकेकादन्तम्वन्मिस्रान्तर वदन्ति यन्ति विपरीतरूपम् ।
 मृगन्मिस्रटादण्णोऽण्णान् तु तथैवनेत्रघ्न दण्णान् तु क्रमात् ॥
 गजोष्ट्रगोऽश्वान् व्यजवन्ति सन्धी चतुर्थभागे च सकर्णिक वदेत् ।
 प्रस्थस्त्वजा योर्भिः निरुहमाता गरादिषु द्वितिगुणो यथा बलम् ।
 निरुह उष्ट्रस्य तथाद्वयस्य गजस्य त्रितिस्रनुवासनेऽष्टम ॥

animals in the following manner. The leather bag of the vasti-yantra should be made of a buffalo's bladder for goats, lambs, elephants, cows, camels and horses. The vasti for these animals is known as savasti and uttara-vasti is uttara-savasti. The tube of the savasti should be eighteen anguli long for elephants and camels, sixteen anguli for cows and horses and ten anguli for goats and lambs. Like the vasti-yantra used for men, it should have a projection at the junction (of the tube with the bladder) and another at the fourth division of the tube from the end."

In the Āśvavandya¹ the tube for the horse is thus described: "The tube should be made either of wood or metals, or horn, or bamboo, or reeds. Its length should be twelve anguli and circumference six anguli. The wise surgeon should make the tube of such a calibre as to allow a plum seed to pass through it easily. It should be straight, polished and tapering from the base. At a distance of four anguli from the end of the tube, a projection should be used, while for tying the leather bag firmly to the tube two projections ought to be constructed at the base."

Pālakūpya² describes the rectal clysters for elephants. He advises that these are to be made either of wood or bamboo. The end is bulbous and the surface smooth. The length

१. काष्ठेदंतेर्योमिय मन्थननादिभिः ।

दादनाद्दृष्टार्थं न परितारे षडङ्गुलम् ॥

कीलाभ्यमावृत्तं न कुशाभिर विचलनम् ।

मुद्रादङ्गुलस्य अस्मस्य न विक्षेपत ॥

व्यक्ताङ्गुलानि चत्वारि कर्णिकान्तस्य कार्थवत् ।

षट्कस्यप्रवन्थाय मुनिं हि चापि कर्णिकम् ॥

Āśvavandya, XVI vs 2—4

Pālakūpya's Hasti Āmveda. Sec. IV. Ch. V.

length of the tube varies, the most convenient being sixteen anguli for men and sixty-eight anguli for elephants. The projections at the base of the tube should be twelve anguli high. He describes in detail the method of introduction, position of the elephant, etc.

Drdhavala advises us to reject the following eight kinds of tubes and eight kinds of bags¹ —

I Tubes—

- 1 Hrisva or too short. For the injection does not reach the proper place.
- 2 Dīgha or too long. For the injection passes beyond the proper place.
- 3 Tana or too thin. The injection can not pass through the tube easily and so the bag may burst.
- 4 Sthula or too thick. The tube pulls the mucous membrane of the rectum and anus backwards and forwards during its entrance and exit.
- 5 Jīna or old, weak and delicate. The tube may break inside the rectum during its introduction and so cause injury to the gut or anus.

१ इयं दीघं तन्मृदुलं श्रीणं गिच्छिन्वन्मनम् ।
 पार्श्वं चिद्रं तद्यो वक्रमष्टौ निवाणि वर्जयेत् ॥
 अप्राप्तातिगतिर्लोभकयेण चणनराया ।
 गुदपीडा गतिजिह्वा तेषां दीया यथाक्रमम् ॥
 मासलच्छिद्रविषमस्थूलजा न कषातला ।
 क्षिप्रं क्षिप्रय तानष्टौ वस्तीन् कर्मासु वर्जयेत् ॥
 गतिर्विषम्यविसत्त्वसाय्यदीयाश्च निसवा ।
 फेनिलघुतधार्यैव वस्ते स्याद् वस्तिदीपत ॥

- 6 Sūthilabandhana—The tubes do not fit the bags well, so during compression of the bags, the injected fluid runs out by the side of the tube
- 7 Pārsvechudra or leaky—Having slit on the side, the tube may injure the soft parts by rubbing against them
- 8 Baka or curved—The motion of the injected fluid would be curvilinear—It will strike a side of the rectum and so would not go inside the gut

II Bags—

- 1 Mamsala or fleshy—The bag emits bad smell
- 2 Chudra or leaky—The injection escapes outside
- 3 Asama or uneven—Parts are unequally compressed and so the injection does not issue in a forcible jet
- 4 Stūha or thick—It is difficult to grasp the bag and so it can not be forcibly compressed
- 5 Jāla or having a network—The injection comes out
- 6 Vṛta or hollow, airy and incompressible—If air can not be expelled out, froth forms in the injection, and so air is pumped into the rectum
- 7 Chinna or torn—The injection flows down
- 8 Kṣinna or moist—The injection can not be forced out

Suśruta mentions eleven defects of tubes and five defects of bags of the Vāstavantra.¹

¹ अतिमृदुर्ल कर्कशमवगतमगमिन्न मग्रिरुष्ट विप्ररुष्ट कर्णिक मृश्रातिच्छिद्रमतिदीर्घ-
मतिदृग्मिलकादग नैवदीपा । पण्डताम्यता सन्निद्रता प्रमीर्णता दुर्विज्ञतेति पञ्चवन्ति
दीपा ।

I Tubes—

- | | | | |
|----|-------------------|-----------------------|--|
| 1 | Atisthūla | Too thick | } Such tubes injure the rec-
tum and so cause pain |
| 2 | Karkasa | Rough | |
| 3 | Avanata | Curved | |
| 4 | Anna | Too thin | } It becomes use-
less to inject
fluids into the
rectum |
| 5 | Bhanna | Broken | |
| 6 | Sannikṛta Karmika | Projection near | |
| 7 | Vipriṣṭa Karmika | Projection
distant | } Injure the rec-
tum which bleeds |
| 8 | Sūksma | Small orifice | |
| 9 | Atulasya | Too short | } It becomes difficult to inject
as the fluid comes out |
| 10 | Atichudra | Large orifice | |
| 11 | Atidighṛa | Too long | } Too much fluid passes into
the rectum and so pain is
complained of |
| | | | |

II Bags—

- | | | | |
|---|-------------|---------------------|--|
| 1 | Vahatā | Fleshy | } It is difficult to tie the bags
over the tubes properly |
| 2 | Prastinatā | Large | |
| 3 | Sacchudritā | Perforated | } No fluid can be forced
into the rectum and so
the instrument is use-
less |
| 4 | Durvaidhatā | Difficult to
tie | |
| 5 | Alpatā | Small | Small quantity of fluid passes into the
rectum |

गुटं भवेत् क्षतं रुक् च साधनं प्रवेष्टुं शक्यम् ।

आमूत्रं कर्णिके नेत्रे भिन्नेऽर्णो वाय्वपायकः ॥

अवसेको भवेदन्तर्यामादोषान्निवर्त्तयेत् ।

प्रकृतं कर्णिके रक्ता गुदमग्नं प्रपीडनात् ॥

क्षरत्यत्रापि पित्तघ्नो विधिर्वन्तियः पिच्छिलः ।

द्रव्वेत्त्वग्मुतोसि च क्रोशो वन्तियः पूर्ववत् ॥

प्रत्यागच्छन्तः कर्ण्योद्गोशान् वन्ति विधातजान् ।

दीर्घं महासोतसि च शीयमत्यवपीडयत् ॥

प्रस्तीर्णं वन्ति चापि वन्ती दुर्ध्वं दोषवत् ।

वक्तावन्त्येऽन्यता चापि द्रव्यस्यान्यगुणा मता ॥

दुर्ध्वं चाणु भिन्ने च विज्ञेयं भिन्नं नेतवत् ।

16 UTTARA-VASTI

Urethral, Vaginal and Uterine Tubes

Injections into the urethra and vagina are also recommended to be thrown in by similar contrivances the tubes being adopted in length and circumference to the length and breadth of the passages for which they are intended

1 Tubular Instruments for the Urethra

The tubes intended for applying medicines into the male urethra is recommended to be twelve anguli long Suśruta¹ advises us to use tubes fourteen anguli long It is to be made of gold and is called Puspanetia Its circumference is equal to that of a stalk of flower of Jātī (*Jasminum Grandiflorum*) or Mālatī (*Echites Caryophyllata*, Rox.), and the lumen of the tube allows a mustard seed to pass through it It is provided with an annular projection just at the central part Caraka² says that

¹ वस्त्रोत्तरसज्जस्यविधि वचनात्परम् ॥

चतुर्दशाङ्गुलं नेत्रमातुराङ्गुलं समितम् ।

मालतीपुष्पवन्ताय छिद्रं सर्षपं निर्गमम् ॥

सेद्राग्राममम केचिद्विच्छन्ति खलु तद्विद ।

हेह प्रमाणं परमं कुक्ष्यशत्रुं प्रकीर्तितम् ॥

पञ्चविंशदधोमात्रा विदध्याद् बुद्धिकल्पिताम् ।

निविष्टकर्णिकं मध्ये नारीणां चतुरङ्गुलम् ॥

मूत्रस्रोतं परीणाद् मुह्यं वा हि दशाङ्गुलम् ।

तासां पत्युर्मात्रं तु निदव्याच्चतुरङ्गुलम् ॥

द्व्यङ्गुलं मूत्रमार्गं कन्यानां त्वेकमङ्गुलम् ।

वितीयं चाङ्गुलं तामा विधिवद्वाच्यते यथा ॥

Suśruta Samhitā, IV १११११

² पुण्यनेवञ्च हेम स्वात सूक्ष्मसौत्तरवस्तिकम् ।

it has two projections while Vāgbhata¹ describes three. The bag is to be made of goat's bladder. A probe is first passed into the urethra to examine its condition and then the tube is introduced up to the length of six anguli. The bladder which contains the injection and which is tied tightly round the tube, is then compressed to force the fluid into the urethra. The tube of course, varies in size according to the dimensions of the organs of generation.

For the female, the paspanetra is described to have the length of ten anguli. The projection is at a distance of four anguli from the base. The circumference of the tube varies according to the width of the urethral canal. The calibre of the tube allows a moong to pass through it -

अस्ताप्यस्य प्रलेन मम गोपणस्यिगम् ।

रीण्य या मधुपण्डित द्विकर्ण हाटगाङ्गुलम् ॥ ४२ ॥

Caraka Samhitā VIII. ix

¹ आतृगाङ्गुलमस्ति तत्रैव हाटगाङ्गुलम् ।

इति गोपणस्य मूत्र मण्डयो मूत्र कणिक ।

मिदायक प्रवेगाय द्रव्ये तेसादि मण्डय ।

कुन्दाश्मार समन पण्यन्तोपम दट ।

तस्य वस्त्रिर्गुणवृत्ताया गफिर्धिकस्या वा ॥

नेत्र दगाङ्गुल मूत्रप्रवेगसत्तरङ्गुलम् ।

अपत्यमार्गे योज्य स्याद्गाङ्गुल मूत्रवत्सर्पिणि ॥

मूत्ररुद्धविकारिषु वानाया स्त्रिकमङ्गुलम् ।

Astāngka Herdaya Samhitā I. cix

² पुण्यनेत्र प्रमाणन्तु प्रमदाना दशाङ्गुलम् ।

मूत्रस्रोत परीक्षाः मूत्रसीतोऽनुवादि च ॥

गर्भमार्गे तु नारीणा विधेय चतुरङ्गुलम् ।

हाङ्गुल मूत्रमार्गे तु बालाया स्त्रिकमङ्गुलम् ॥

Caraka Samhitā, VIII, ix

Catheter

It is curious to find no description of so important an instrument as the catheter. Injections were thrown into the catheter, the tube used was always a straight one, having the length of 12 inches, but it could not possibly have reached the bladder, as it is not known where the column been put for a distance of 12 inches. The tube might have served as a force-pump. The female catheter of the Greeks, as preserved in the Nāḍī manuscript, is 0.95 mm. long and is composed of metal or (M. line).

In the *Yājñavalkya Smṛiti*¹ however, we find a hymn, more probably a description of catheter in ancient times:

ॐ नमो भगवते वासुदेवाय । ॐ नमो ॥

The hymn is addressed to the deity for regulating the flow of urine. The first couplet is a primitive form of a fixed mantra, the *avayānta* (one of the *nāḍīvāntā*) of the *trīphala* — but however do not appear to have made frequent use of it."

6. What in thine entrails, thy (two) groins, what in thy bladder has flowed together—so be thy urine released, out of thee with a splash! all of it. (In the groin are two vessels located in the two sides affording access to the receptacle of urine)

7. I split up thy urinitor, like the wen of a tank—so be thy urine released, out of thee, with a splash! all of it.

8. Unfastened (be) thy bladder orifice, like that of a water-

¹ BH. 1. 1. Whitne's translations and annotations.

holding so—so be the urine released, out of thee, with a splash! all of it

9 As the arrow flew forth, let loose from the bow,—so be the urine released, out of thee, with a splash! all of it”

2 Tubular Instruments for the Vagina

Similarly injections were thrown into the vagina. The vaginal tube should be thicker than the urethral tube and in circumference should be equal to that of the little finger. It should be introduced into the vaginal canal up to a distance of four anguli, whereas into the urethra, the tube was allowed to enter up to a distance of two anguli only in the adults and of one anguli only in the girls.¹

3 The Uterine Tubes

The uttira-vasti comprises the urethral syringe—male and female—and the vaginal and uterine clysters. No distinct uterine tube is described in the text books. But Suśruta² says

¹ चाट्माहुक नेत्र मय च हतकण्डिकाम् ।

मालतिपुष्पहस्ताभित्तिं मुदं पनिर्यमम् ॥

* * * *

स्त्रीणां कनिटिकाग्नौ नेत्र कुशोदशाहुलम् ।

मुहप्रवेगं योष्य योन्मन्यतुरहुलम् ॥

षाहुल मन्मार्गे च गुण नेत्र नियोजयेत् ।

सृष्टरुध्विकारिणं बालानामेकमहुलम् ॥

Sūragadhara Samhitā, III vii

Bhāva Prakāśa, I ii

² उद्गृज्यान्मिथं दद्याद्धानाथैर्विचक्षण ।

कम्पतरस्य कण्ठाथै दद्यात् स्रष्टु पीडित ।

तिक्तर्णिकेन नेत्रेण दद्याद्योनिमुख प्रति ।

गर्भाग्नय विगृहार्थं नेत्रेण दिगुणेन तु ।

अप्रत्यागच्छति भिषक यस्मात्पुष्परसशिते ।

that to apply *uttāra-vasti* to a female, she is advised to lie supine, keeping her knees flexed and well raised. For a gūl the quantity of injection is one *prāsita*.

To purify the uterine cavity, apply a clyster of twice the quantity of oleaginous medicines, inside the vagina by means of a tube having three rings. If after the application, the only medicine does not flow out, then apply a second clyster containing medicines of the group called *śodhana* or purifiers, into the rectum, or let the clever surgeon introduce a probe into the space of the clyster, or press under her navel deeply by his closed fist. As the object of the injection is to clean the cavity of the uterus, there can be no doubt that a uterine tube is referred to in the passage. Again the precautions recommended if the injections do not come back easily, point to a uterine tube to have been used, for injections into the vagina can not be delayed in coming out. The Hindu writers often confounded the intra-uterine and urethral injections with the vaginal clyster. *Caraka*¹ says "The *uttāra-vasti* is to be used for the females during the period of menstruation, for then the uterus, being in a condition fit for impregnation, has its mouth open and so can easily be reached by the injection." This shows that uterine medication to be the object aimed at by the clyster.

- भूयो वक्ति विदध्यातु सगुक्त शोधनैर्गणै ।
गुदे वक्ति निदध्याद्वा शोधनद्रव्यं सभृता ।
प्रवेशाद्वा सतिमान्वस्तिहारसंयेषणीम् ।
पीडयेद्वाप्यधोनाभिर्वलीनोत्तरमुष्टिना ।

Suśrūta Samhitā, IV 222vii

- ¹ स्त्रीणाञ्चार्चवकालं तु प्रतिकर्म तदाचरेत् ।
गर्भासना सुखं स्नेहं तदादत्ते क्षपावता ॥
गर्भं योनिस्तदा शीघ्रं जिते गृह्णाति मासते ॥

Caraka Samhitā, VIII 12.

The Greeks were no better, for Milner also complains "It is difficult to separate ancient descriptions of injections into the vagina from those into the uterus, for the terms for the two parts are frequently interchangeable." Again he says "It is probable that at other times under the heading of 'injections of the bladder', only injection of the urethra is meant!"¹

18. TUBULAR INSTRUMENTS FOR INHALATIONS AND IRRIGATIONS

The tubes for smoking were made, like the vasisht tubes, of various metals, or glass, or wood. Caraka describes it as a straight tube having three panches. The end of the tube is equal in diameter to that of a plum-wood. Śūringadhara² adds that a reed or bamboo pipe will also serve the purpose. It is described as a straight tube, the broad base of which admit the patient's thumb while the narrow end, a plum-wood. Suśruta³ describes the base

¹ Greco-Roman Surgical Instrument. P. 107 S.

² चतुर्विंशतिर्नाम सुश्रुतिभिर्विचरन् ।
 क्षातिशतद्रुमैरेव प्रयोज्यं चानिष्ठिका ॥
 जगद्विकोपकृतिर्योऽप्यग्न्यग्न्याग्नितम् ।
 यन्निचैव समद्रव्यं धूमनेन प्रशस्यते ॥ १६

Caraka Samhitā, I. 3

³ धूमनाडी भवेत्तत्र तिरस्कृता च विषयिता ॥ १०
 कर्माहिता परीक्षाया राजमात्रमात्रा ।
 धूमनाडी भवेत्तत्रावा शमने रोगिणीऽङ्गुलि ॥ ११
 चत्वारिंशतिरैकपट्टादिशक्तिर्हृदी शृता ।
 ती ने चतुर्विंशतिभिः चासृष्टे पौडगोन्मिसे ॥ १२
 दशाङ्गुनिर्वाग्नीये तथास्यान्त्रवगाजिका ।
 कफायसङ्घनान्मूत्रा कुर्यादाग्नरन्ध्रका ॥ १३

Śūringadhara Samhitā, III. 13

⁴ तत्र वस्त्रिषट्त्रयेर्धूमनेषट्त्रयाणि व्याप्यतानि भवन्ति । धूमनेषु वस्त्रिषट्त्रयाणि परिणाहमे कलाग्रमाव सोतोसृजिऽङ्गुष्ठपरिणार धूमवर्ति प्रवेश सोतोऽङ्गुष्ठान्यष्ट चत्वारिणत् प्रायोगिके । क्षातिशत् रोदने । चतुर्विंशतिर्विचरने । पौडशाङ्ग कान्धे वामनीये च ।

and end of the tube to be equal in circumference to that of the thumb and little finger respectively. The orifice should allow a common pen to pass easily through the tube. Vāgbhata¹ says that there are three pouches or dilations of the tube, shaped like the half-open buds at equal distances from each other. The tube is supposed to consist of four equal parts. The first pouch is located at the end of the first part, the second and third pouches at the ends of the second and third parts respectively. Cakradatta² also describes it similarly.

Diḍḍhābhā³ mentions another method of inhalation. He makes a paste of the medicines prescribed and smears it on a piece of silk cloth. This is then to be rolled round like a wick. This wick is to be dipped in ghee before use, and fire lit at one end, while the patient is to smoke it through the other end.

एते अपि कोलाग्रिमाय छिद्रे भवतः । ब्रणनेवमष्टाङ्गुलं ब्रणधूपनार्थं कलायपरिमण्डलं
कुदत्यवादि स्रोत इति ।

Susruta Samhitā, IV २१

¹ वणि नेत्र सम द्रव्य तिकोप कारयेदृशु ।

मृगाऽगुष्ट कोलाग्रि प्रवेश धूमनेवक ।

तीक्ष्ण खेदने मध्येषु तीक्ष्ण चत्वारि पञ्च च ।

अष्टाङ्गुलीना यस्मात् पातु प्रमाणी नाटकानि तत् ॥ ६ ॥

Astānga Hṛdaya Samhitā, I २२१

² ऋजुत्रिकोपफनित कोलाग्र्यप्रसाणितम् ।

यन्निनेरुसमद्रव्य धूमनेव प्रशस्यते ।

साङ्गम्यगुत पूर्णोदन् प्रायोगिकादिषु ।

नेत्रे कासदरे त्र्यङ्गुलीन शिपे दशाङ्गुल ॥

Cakradatta, Dhūmapānādihikāśa

³ प्रपुण्डरीक मधुक शाङ्गं सप्तमं शिलासु ।

सरिच पिप्पली द्राक्षामेता सुरसमञ्जरीम् ॥

कृत्वा वत्ति पिबेद्भूमं क्षीमचितानुयर्चिताम् ।

घृताक्षाम्नु च क्षीरं गुडीदकमथापिवा ॥

Caraka Samhitā, VI २२२

Both Caraka¹ and Susruta² describe a device for making tubes of medicines, the form of which is described to be smoked in the following manner—Powder the medicaments and make a paste, measure out a bar-l, take a smooth reed (Sachcharum sacra, Rox.) twelve anguli long. Apply the paste round the reed, for a length of eight anguli. Dry it in shade. Remove the reed, leaving a closed tube of the paste. When required for smoking, light one end of the tube with a burning vessel and smoke through the other end.

Caraka³ describes another inhaler, which consists of two earthen basins (cumbas) placed up in each other, their edges being pasted with flour. The upper one is perforated at the centre for the reception of one end of the tube, the patient puts the other

- १ विशाग्निहस्तविद्यायां तां वसिष्ठं चरित्रम् ।
 चतुर्दशविधां पञ्चादष्टादशममाग्निम् ।
 दत्ताग्निर्मां तां वसिष्ठं भूमनेनपिता नरः ।
 यथातमश्चिद्वृद्धां पिबेत् प्रायेणिकीं सुखम् ॥ ६ ॥

Caraka Samhitā, I. 3.

- २ अथपिशाग्निपिबेत् सुदृढां धातुनाग्निम् ।
 धूमद्रव्यं कर्त्तव्यं विद्यादाहान् कृतम् ।
 कम्प कर्त्तव्यं शिवाद्यां दत्तव्यं वार्यम् ।
 इष्टिवासवनीयाय येनाद्या वसिष्ठोदगतम् ॥
 अश्वत्थोदपिता कृत्वा घृत्वा नित्यं रन्मुक्तम् ।
 वदनेन पिबेद्भुजं वदनेनैव मयं जेतम् ।
 नासिकाभ्यां ततः पीत्वा सुखेनैव वर्मेत सुधम् ।

Susrutahara Samgraha III. ix.

- ३ मधुच्छिदं सज्जसं हृतं मज्जकसपुटे ।
 कृत्वा धूमं पिबेच्छृङ्खलं वा चायुं वा गवान् ॥
 ग्योपाकर्त्तव्यमानानां नाडीं यथा कुम्भं वा ।

Caraka Samhitā VI. 221.

end into his mouth for inhalation. The lower pot contains glowing charcoal of catechu (*Accacia catechu* Linn) wood, over which are put pills of necessary medicines. The tube is from eight to ten anguli long ¹. This inhaler is intended for phthisical subjects. It is useful for allaying cough and exciting emesis. This instrument is called *mallaka samputa* or *śorāḍa samputa* or a pair of earthen basins. In such an apparatus Caraka recommends us to put powders of cow's horn, hairs, nerves and ligaments, besides other medicines. Suśruta², Vāgbhata³ and Cakradatta⁴ also describe it. Śārngadhara⁵ however reserves this instrument for fumigating wounds only.

The length of the pipe will vary according to the different kinds of smoking prescribed by the physician. There are five kinds of smoking narrated —

- 1 Śamana, madhya, pratyogika—medium
- 2 Bimhana, snehana, mṛdu—mild

¹ दशाङ्गुलीन्मिता नाडी अथवाष्टाङ्गुलीन्मिताम् ।

शरावसपुटच्छिद्रे कृत्वा जिह्वा विचक्षण ॥

वैरेचन सुखेनैव काशवान् धूममापिवेत् ।

Caraka Samhitā, VI xxii

² इतरयोर्व्यपेत धूमोद्धार स्थिरे समाहिते शरावे प्रक्षिप्य वृत्तिं मूलच्छिद्रेणान्येन शरावेण पिपाय तस्मिन्च्छिद्रे नेत्रमूल सयोज्य धूममासवेत् ।

Suśruta Samhitā, IV xl

³ शराव सम्युटच्छिद्रे नाडी न्यस्य दशाङ्गुला ।

अष्टाङ्गुला वा वक्त्रेण काशवान् धूममापिवेत् ॥

Aṣṭāṅga Hṛdaya Samhitā, I xxi

⁴ अथवा सष्टतान् शक्नून् कृत्वा मल्लिकासम्पूटे ।

नवप्रतिश्लायवता घ्नम वैद्य प्रयोजयेत् ॥

Cakradatta, Nāśāroga Cikitsā

* See foot note 2 P 145

| | | |
|---|-------------------------|--------------|
| 3 | Recina, śodhana, tīk-na | — strong |
| 4 | Kāsaghna | — anti-cough |
| 5 | Vāmana | — emetic |

So the length of the tube would vary thus—

1 Caraka ¹

| | Anguli |
|-------------------|--------|
| In strong smoking | 24 |
| „ medium „ | 32 |
| „ mild „ | 96 |

2 Suśruta ²

| | |
|--------------------------|----|
| In medium smoking | 48 |
| „ oleaginous „ | 32 |
| „ brain-sedative „ | 24 |
| „ anti-cough or emetic „ | 16 |

3 Vāgbhata ³

| | |
|-------------------|----|
| In strong smoking | 24 |
| „ medium „ | 32 |
| „ mild „ | 40 |

4 Śārṅgadhara ⁴

| | |
|---------------------------------|----|
| In medium smoking | 40 |
| „ mild „ | 32 |
| „ strong „ | 24 |
| „ anti-cough „ | 16 |
| „ emetic or
wound-fumigation | 10 |

FUMIGATION

Similarly wounds are said to be purified by suitable medicinal fumigation. In the purification of wounds by fumigation, we get a glimpse of the antiseptic method of treatment in its

¹ See foot-note 2 P 140

² See foot-note 1 P 141

³ See foot-note 4 P 140

⁴ See foot-note 3 P 140

embryonic form. Susruta recommends the tube to be eight angula long, and to have the circumference of a common pea, and its calibre should be of the size of a kulittha (*Dolichos biflorus*, Lam.). The fume of medicated substances from the inside of an enclosed pot containing fire pass out through the tube and are placed to play on any one to purify it. For this purpose a weathered pot of the shape of a lamp may conveniently be used as before. Śaṅgadhara uses a tube ten angula long and recommends the use of *Nepenthes* (*Acetorhiza Indica*) for wound-fumigation. Another instance of the application of the principle of negative methods to practical therapeutics, we may mention the use of medicinal injections into the cavity of the uterus to cure its morbid condition.*

A similar instrument is used to fumigate the uterus and vagina, and is called the *cupita*. "Fumigation", says Susruta, is to be applied to the vagina by burning the

॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥

Susruta Samhitā, IV. xl

॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥

Ibid. IV. 1

* ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥

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Śaṅgadhara Samgraha, III. ix

See foot note 2, P. 1118

* ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥ ८८ ॥

Susruta Samhitā, III. x,

slough of a snake (Bungarus) or pinditaka (?) wood, in cases of obstructed delivery of the fœtus Caraka¹ mentions fumigation of the vagina by burning Bhujapatia (Betula Bhojpatia), glass, precious stones and the slough of a snake as one of the means for removing the placenta To remove the after pains and difficulty in micturition and defæcation, Suśruta² advises us to fumigate the vagina He recommends fumigation of the uterus with purifying medicines In fumigating these parts, the Hindu surgeons desired a local action, and did not share in the belief, held by some of the Greek gynecologists³ that "the uterus was an animal within the body which could wander about, being attracted by pleasant smells and repelled by disagreeable smells" ⁴ The Arabs also did not believe uterus to be an animal This method of treatment was well known to the Greeks, for Hippocrates⁵ writes that "fumigation with aromatics promotes menstruation and would be useful in many other cases, if it did not occasion heaviness of the head" He "directs us to take a vessel which holds about four gallons and fit a lid to it so that no vapour can escape from it Pierce a hole in the lid, and into this aperture force a reed about a cubit in length so that the vapour cannot escape along the outside of

¹ सर्पपत्रकाचमणि सर्पनिर्मोकीयास्रा योणि धूपयेत् ।

Caraka Samhitā, IV viii

² कटुकालावुक्तवेधन सर्पप सर्पनिर्मोकीर्वा कटुतैलविमिश्रैर्योनिमुख धूपयेत् ।

Suśruta Samhitā, III x

³ Aeternus Morb Acut ii 11
Plato's Timæus

⁴ Greco Roman Surgical Instruments P 158
Adam's Commentary on Paulus Ægineta, Vol I Bk ii P 636 37

⁵ See also in the Hippocratic treatises as Nat Mul vii, 9, 1 Morb Mul vii 1, II Morb Mul vi 20, 21, Steril vi 3, Superfret ix 3, x 9, II

the root. The cover is then fixed on the vessel with clay.²¹ Orbanus²² and Soranus used similar instruments for the pump.

DISTINCTION OF ROOMS, CHAMBERS, etc.

Cretaker²³ says that if peacock's feather, bones of vaka bird, white mustard and red sandal wood, well powdered and mixed with ghee be used in fumigation the poison of a room, beddings, seats and clothes is got rid of. Sūrigudhar²⁴ advises us to disinfect a sick room by the fumes caused by burning the following substance with the peacock's feather. Nim leaves (Melia Azadirachta), Anchari pepper, asafotida, Jotūmamsi (Nardosachys pinnatifida), seed of Salmali (Bombax malabaricum), gauri, hair, tongue of a serpent, cat's feces and ivory. Sūśrūta²⁵ advises fumigation of a sick room for a surgical patient for

Orbanus, *Surat*, in *Harman's P.* 159.

Cretaker.

Soranus, *Surat*.

* विभिन्नैः स्यात्पर्याप्तं साधारणं च तन्मृत् ।

युक्तं च स्यात्सामान्यमार्गैः च द्रव्यैः विद्वत्सु ॥४४॥

(Cretaker, *Sambhuta*, VI, xxv)

सूत्रदिग्दर्शकः [सूत्रम्] पठन्ति यथाशक्तम् ।

सर्वेषां हि हिंसासौ च भौतः कायामुत्पन्नम् ॥

• धान्यं, मातृनिर्मोक्तं विना वैद्यनिका मया ।

मन्त्रादयः तद्वत् किञ्चिद्भूतं विभिन्नितम् ।

वेदेषु धूपनं दद्यात् सर्वत्राप्यप्यत्र ॥

विशालान् शालामत्रित्वा मध्यपरपर्यो भवेत् ॥

(Sūrigudhar, *Sūgraha*, III, ix)

* सधंपाष्टिपताभ्यां सधियां लवणं च ।

द्विरन्ध्रं कार्येऽप्युप दशरात्रमतन्द्रित ॥

(Sūśrūta, *Sambhuta*, I, xix)

ten days, morning and evening, after the operation has been performed

15 TUBULAR INSTRUMENT FOR CUPPING

Generally cow's horn is recommended for the purpose. It is eighteen anguli long, its base, forming the mouth of the instrument, is three anguli wide (Vāgbhata) ¹. It is conical in shape and the cone is said to be either curved or straight. The other end is pointed and perforated to the extent of allowing a mustard seed to pass through it. The narrow end, however, is made to assume the shape of a woman's nipple by winding thread round it. This facilitates the operation of suction by the mouth of a surgeon when the broad end is placed against any diseased area of the patient's body. Suśruta² mentions its use in blood-extraction. For extracting blood, the part must be scarified before its application, and to facilitate the operation, the part should be fomented (Yogarātnākara) ³. After suction, the horn is to be covered by a piece of cloth or a small bladder of animals.

Vāllūki⁴ describes the śinga thus — "It is the horn of a white cow, half-moon shaped and seven anguli broad. The orifice

¹ त्र्यङ्गुलास्य भवेच्छृङ्ग चूषणेऽष्टादशाङ्गुल ।

अग्नेसिद्ध्यर्थकच्छिद्रं सुनम्बुचुकाकृतिः ॥

Astāngra Hidayā Samhitā, I xxx

² तत्रप्रच्छिन्ने तनुवस्त्रपटलावनष्टेन शृङ्गेन शोणितमवसेचयेदाचूषणात् ।

Suśruta Samhitā, I xiii

³ स्नेहं विदध्यात्कुशलस्य नाद्या शृङ्गेन रक्तं बहुश हरिष्य ।

Yogarātnākara Aibuda cikitsā

⁴ विषाणं श्वेतगोरिन्दूचक्रं सम्राङ्गुलायतम् ।

क्षिप्तान्तं पिचुपेक्षिकं योज्यं वातयुतेऽसृजि ।

अङ्गुष्टे मूलवन्मूले छिद्रमग्रेऽस्य सुदृढवत् ।

Vāllūki quoted in Nibandha Samgraha, I viii

at the base is equal in circumference to that of the base of the thumb, while the end which is perforated admits a noong. This orifice at the end is closed by a wick of cotton." Cakrapāṇḍita says that the horn should be three angula long, and its orifice should be of the size of the stalk of an oleander flower.

Suśruta mentions a peculiar use of the horn¹ the extraction of an insect, cerumen, etc. from the middle ear by means of a horn or a probe. The horn was evidently used as an apparatus for suction, and Suśruta describes suction as one of the methods of extracting śalya from the body.² Caraka³ uses horns and leeches to extract venom from a snake-bite, and Suśruta also refers to it. Besides the horns and cupping glasses, suction used to be accomplished by the surgeon's mouth.

Similarly Paul⁴ says that foreign bodies may be sucked out from the ears with a reed.

On the method of suction as a mode of treatment, Erichsen⁵ says — "In former days, when duels with the small swords were of frequent occurrence, persons called "suckers" who were often the drummers of a regiment, were employed to attend the wounded combatants. This treatment which was conducted with a certain degree of mystery, consisted in sucking the wound till all blood ceased to flow, and then applying a pellet of chewed

¹ कर्णच्छिद्रे वर्धमानं कौटं क्लेदमलादि वा ।

शङ्खेणापहरन्तीनामथवापि शलाकया ।

Suśruta Samhitā, VI २२१

² See foot note 3 P. 108

³ दश वा चुपेन्मुखेन यवचूर्णं पाशपूर्णम् ।

प्रच्छन् विषजलौकं शङ्खे स्नाय्य ततो रक्तम् ॥

Caraka Samhitā, VI २२४

⁴ Paul VI. २२१ and III २२३.

⁵ Erichsen's Surgery, Vol. I p. 341.

paper or a piece of wet linen to the orifice, in this way it would appear that many sword thrusts traversing the limbs were healed in a few days. The process of suction cleared the wound thoroughly of all blood, and drawing the sides into close apposition, placed the parts in the most favourable condition possible for union by primary adhesion. This practice might, perhaps, in many cases advantageously imitated in the present day by means of a cupping glass and syringe."

We also find Suśruta¹ describing a vasti yantia in the treatment of snake-bite. The tube is open at both ends, one end is applied to the part bitten by the snake, while to the other end the surgeon puts his mouth to suck out the poison. So this vasti yantia may be compared to the modern aspiration syringe.

Cupping instruments of metal or horn are still used by the Arabs in Kordofan and Sir R. Pasha² suggests that cupping is possibly borrowed by the west from the "most perfect physicians" the Arab. But now we are confident that the credit is due to the Hindus.

ALĀBU YANTRA

Alābu or gourd is described to be made of the bark of the succulent fruit called alābu (*Lagenaria Vulgaris*). The pulp is scraped away and the bark is allowed to dry. Such a bark should be selected which is twelve and eighteen anguli in length and circumference respectively. Its mouth should be circular and should have a diameter of three or four anguli. A fire is to be lit inside it by burning a strip of dry cloth to produce a vacuum, and the

¹ प्रतिपूर्य सुखं वन्नेर्हितमाच्छूषणं भवेत् ।

Suśruta Samhitā, V. 1

² Vide Third Report, Wellcome Research Laboratory at Gordon. P. 316

instrument to be applied instantly to the intended part of the patient's body. It should be thus used to draw blood and phlegm from the body (Vāgbhata¹). In modern times cupping glasses are used for like purposes in a similar manner.

Vālluka² describes the alābu yantra thus:—"The mouth of the instrument is well formed and has the diameter of four angula. The body has the circumference of eight angula and is well smeared with a paste of black mud. It is used for drawing out blood." In *Yogaratnākara*³, śūgra and alābu are directed to be used for extraction of blood from accidental wounds. Caraka mentions the use of alābu for blood-extraction⁴.

Another instrument known as the ghṛtī yantra was used exactly in the same way. It is said to consist of a brass pot

¹ मण्डादमण्डप्यायुज्ज्वलं तटा मण्डपम् ।

अथवाद्भ्यः अणामोऽनोक्तं च शरत्कृतम् ॥

Astānga Hṛdaya Samhitā, I, xxx

² एताद्भ्यः परीक्षायां चतुरङ्गनादसंश्लिष्टा समुपरी कणमटानिष्ठा तत्र श्रेष्ठा रक्षास्तेषां नाशरिति ।

Vālluka quoted in Nibandha Samgraha I, xiii

मानदीपया, लाधा ।

Saṁhita Samhitā, I, xiii

³ लिप्ते भित्ते तथा विद्धि धृतिं मयी भिषगवर ।

परमैरेण मम ह व्रणं व्रणविशारद ॥

दुःखमर्थं दृष्ट्वा ना प्राप्नोति व्रणी नरः ।

अथवा दीप्यन्वणपोट्या स्वेदयन्मुहुः ॥

मन्त्रमथ तप्तलोष्पावमयोगतः क्रमात् ।

दृष्टं रक्तं स्थितं चापि शङ्खलाव्याटिभिर्हरेत् ॥

Quoted in Yogaratnākara

⁴ रुधिरागमार्थमथवा शङ्खलावभिराहरेत् रक्तम्—

Caraka Samhitā, VI, vii

⁵ तद्वदघटीष्वा गुग्मं विलयीव्रमने च सा ।

Astānga Hṛdaya Samhitā, I, xxx

which is still used commonly in India by all classes of people for drinking purposes. A fire should be lit inside as before and the ghatī applied to the surface of the body covered by a piece of cloth. It soon becomes firmly fixed and is thus used to raise abdominal tumours by means of it for purposes of correct diagnosis and also to effect its cure by subsidence. It is still used by the common people for the same ends.

Caraka¹ says —“After the abdominal tumour has been relaxed or softened a little by fomentation and oleaginous application, it is to be covered by a piece of cloth. Then inside a small ghatī, a fire is to be lit by burning kuśa and other forms of grasses, the pot is then to be inverted and pressed over the part covered by the cloth. By this way, the tumour would be drawn upwards & be made prominent. The ghatī is then to be taken away and after removing the cloth, and examining the extent of the tumour, it is to be incised. The different shapes of the incisions are called vimāṅga, ajapada and ādāśa. After incision, the tumour is to be pressed and rubbed with fingers. But the intestines and the heart must not be touched.”

The extraction of blood by means of cups, has been practised from remote antiquity. It is interesting to note that both the Latin and Greek terms—*cucurbitula* and σικυα signify a gourd,

¹ क्षिग्धस्त्रिग्नशरीराय गुल्मं श्रेयिष्यमागते ॥

परिविध्य प्रदीप्तास्तु वल्ज्जानयवा कुशान् ।

मिषक् कुम्भे समावाप्य गुल्मं घटमुखं क्षिपेत् ॥

स गृहीतो यदा गुल्मस्तदा घटमथोद्धरेत् ।

वस्त्रान्तरं ततः कृत्वा भिन्द्याद्गुल्मप्रसाधनम् ॥

and we know that *Alābu* also means a gourd. It is curious that the instrument should have been known to the ancient Hindus and Greeks by the same name.

Prosper Alpinus¹ (16th century) who wrote a book on the state of medicine in Egypt in his time, gives drawings of cupping horns he saw there. The horns were those of young bulls, highly polished, with a small hole at the top, by which the air was extracted by suction. To close the orifice a small tab of parchment was taken into the mouth and affixed by the tongue. The Egyptians also used cupping glasses, by suction and not by fire, a method evidently unknown to them.

Hero of Alexandria (B. C. 285—222) describes an interesting form of cup. Milne summarises his account thus²—"The figure shows a cup of ordinary flattened form, divided into two by a diaphragm. Two tubes pass through the fundus, one passing through the diaphragm, the other not. Each of the tube is fitted with another which is open at its inner end but closed at its outer end and provided with a small cross bar to rotate it. Each of these sets of tubes is perforated by small openings. In the case of the short tubes, these are outside the cup, in the case of the long tube they are inside the cup, in the chamber shut off by the diaphragm. By rotating the piston these openings can be placed in apposition or not at will, thus forming valves. Open valve A by placing the hole in apposition. Close valve B by turning the holes away from each other. The inner chamber of the cup is now shut off except for the small hole A. Apply the mouth to the valve A, and suck the air out of the chamber. Close valve A. Apply the cup to the affected part. The advantage

¹ *De Med. Aegyptiorum* Ed. 1541 lib. ii. ch. vii. p. 139.

² *Greco-Roman Surgical Instruments* P. 104.

of this arrangement is that the affected part is not directly sucked upon by the mouth, and the instrument is therefore more pleasant for the operator to use"

Celsus¹ thus describes the different kinds of cups — "There are two kinds of cups, bronze and horn. The bronze is open at one end and closed at the other, the horn, open at one end, as in the previous case, has at the other end, a small foramen. Into the bronze kind, burning lint is placed, and then the mouth is fitted on and pressed until it sticks. The horn is placed empty on the body, and then by that part where the small foramen is, the air is exhausted by the mouth, and the cavity is closed off above with wax and it adheres in the same way as before. Either may advantageously be constructed, not only of these varieties of materials but of another substance. If other things are not to be had, a small cup or a narrow mouthed jar will answer the purpose. When it has fastened on, if the skin has previously been cut with a scalpel, it extracts blood, but if it be entire, air"

Paul² remarks that "those which are made with longer necks and broader bellies are possessed of a strong power of attraction." Both Oribasius and Aetæus³ allude to them. Antyllus says that there are three materials of which cups are made—glass, horns, and bronze. A good number of such cups occur in the Naples, British and Scottish National Museums.

¹ Celsus II vi

² Paulus Æginetæ VI vii

³ Med Coll VII vii

⁴ De Morb Acut I 10

Albucasis¹ gives a full account of dry cupping. In applying the instrument he advises us either to create a flame in it, or to fill it with hot water. He gives drawings of various instruments of cupping. Rhases speaks of applying a glass or a cupping instrument to draw off blood after leeching. The other Arabians give little additional information.

In modern times, cupping glasses are used in the same way as before.

V Sālākā or Rods

The rods, or pucker-like instruments, or probes are described to be of various kinds and are recommended to be used for various purposes², so their length and circumference would vary according to some special uses required of them. Suśruta³ says "There are two kinds of sālākā with their ends shaped like the head of the earthworm. They are used for probing abscesses and sinuses.

Two sālākā have their ends shaped like the wing of an arrow. These are to be used for raising any part for the purpose,

¹ Albucasis, Chirurgia 95

नाडीव्रणान् शल्यगुह्यभानुस्नानार्थमुपयुज्यते ।
करीरवालाङ्गुलिभिरपि च वैष्यैर्द्विषक् ।

Suśruta Samhitā IV 1

² शलाकापञ्चाशत्पि नाना प्रकाशाणि नाना प्रयोजनानि यथायोगपरिणाददीर्घाणि च तेषां गण्डपुण्ड्रशरपुङ्गवसर्पफणवडीगुमुखे द्वे द्वे पृष्णं व्यूहचालनाहरणार्थमुपदिश्येते । मसृन्दलमातमुखे द्वे किञ्चिद्वानताये स्त्रीतोगतश्लोद्धरणार्थं । पट्कापांसकृतोष्णीपाणि प्रमाञ्जनक्रियासु । त्रीणि दद्यात्कृतीनि खड्गसुखानि चारौषधप्रणिधानार्थं । वीर्यन्यानि जास्वद्वदनानि वीर्यश्लुश्वदनानि पट्वाग्निकर्मस्वभिप्रेतानि । नामावुद्वहणार्थमेकं कोलास्थिदलमात्रमुखं खड्गतीक्ष्णोष्ठं । अञ्जनार्थमेकं कटापपरिमण्डलमुभयतो मुकुण्ठाय । मृवसागाविगोधनार्थमेकं मालतीपुष्पवन्तायप्रमाणपरिमण्डलमिति ।

Suśruta Samhitā I vii

after incision, of extracting any foreign body from it. Others assign to them the function of bringing together the lips of the wound caused by an abscess being opened and emptied.

Two śalākā have their ends shaped like the hood of a snake. They are useful for transferring any material from one part to another. Some of the simple probes used by the ancient Greek and Roman surgeons carried a single or double snake of Æsculapius at one end. But evidently it was meant as an ornamentation and served no useful purpose.

Two śalākā have their ends shaped like a fish-hook but are blunt. They are used for extracting any extraneous material from the muscles or bones."

The last six kinds of Suśrūta are practically the same as the six śanku of Vāgbhata,¹ which are the following —

The śanku are six in number. Amongst these, two are twelve and sixteen angulī long respectively. They are used for the purpose of raising a foreign body upwards from the wound.

Two varieties have their ends shaped like the hood of a snake. They are ten and twelve angulī long, and they are used for the purpose of moving a foreign body in the wound in all directions.

Two varieties have the shape of a fish-hook—the ends resembling the stem of an arrow. These are used for the extraction of foreign bodies from the wound.

¹ शङ्ख षड्भौ तेषा षोडशद्वादशाङ्गुली ।

व्यूहने, द्वि फणावक्रौ द्वौ द्वादश दशाङ्गुली ॥

चालने शरपुङ्खा स्या वाहार्थं वडिशकृति ॥२५॥

Susruta¹ mentions another pair of salākā which have then ends shaped like a misara pulse, and slightly curved, these are used for the purpose of extracting a foreign body from the external outlets of the body such as mouth, nose, etc. They are eight and nine angula long respectively.

SWAN PROBES

Six salākā are used for the purpose of wiping out the principal excretory canals of the body *viz.* rectum, nose and ears.² Their ends are covered with cotton like a head-dress (pāṅḍī). The two salākā intended for the rectum, have the lengths of ten and twelve angula respectively for short and long distances. So the two varieties of probes for the ears are eight and nine angula long while the other two kinds of probes for the nose are six and seven angula long respectively. Some commentators are of opinion that these six salākā are meant for cleaning the rectum.

For similar purposes the Greek and Roman surgeons used the *epithomela* or *spatula* probe. Priscianus³ writes "First of all we must frequently wipe away the clots of blood from the nose

¹ See foot note 2 P. 155

उभयैर्दण्डमुपै रेतस्य मण्यनारिणा ।

सुहृद्वदन्ते हे मयाता मष्टनवाद्गुप्ति ॥२४॥

Ashtādika Hydhya Samhitā I. xxx

² कावाम विस्त्रिंशथाया शलाका पद्ममार्जनि ।

पायावामास द्वयर्थे ह दण्डादशाद्गुप्ति ।

हे पट् ममाद्गु १ शालं हे कर्णेऽष्टनवाद्गुप्ति ॥२८॥

Ibid

Priscianus xiv

with the end of a spathomele wrapped on the 'berry' with soft wool, and then occlude it by plugging with wool in the same way "

The use of probes, having the ends wrapped with wool, for wiping out discharge of pus from the ears of horse, is mentioned by Jayadatta Suri¹ in his Treatment of Hoises

SPoon-SHAPEd PROBEs

Three probes are described to have their ends shaped like a khala or mortar with a conical cavity, and so they resemble a spoon. They are to be used for the purpose of applying caustic solutions, etc.²

Similarly cyathuscomele, which is a variety of spathomele in which the spatula is replaced by a spoon, is said to have been used by the Greek surgeons to mix, measure and apply medicaments. The specimens of these instruments occur in the Naples Museum. Sometimes the edge of the spoon is sharp and is recommended to be used as a curette. Serivonius Laigus directs us to use the spoon of an ear specillum for the application of caustics to hæmorrhoids.

¹ पूयस्रावेण जानीयात् शोधमभ्यन्तरोक्कम् ।

पितुना वेष्टयित्वा तु शलाकाय समाहित ॥

तेन कर्णान्तरे पूय कर्षयित्वा विचक्षण ।

पातितस्य सुवक्षस्य पूरयेन्मधूसर्पिषा ॥

Aśvāyudyaḥ, Ch. 34, v. 2 and 3.

² See foot note 2, P. 155.

NAIL-SHAPED PROBES

Vāgbhata¹ describes three other probes for the same purpose. They are eight *ṛguli* long, their ends are bent and resemble in size and shape the nails of the third, fourth, and fifth fingers respectively.

Paul² mentions a nail-shaped probe in the treatment of bubonecele. But this was applied as a cauterly and not for the application of medicaments. Nail-shaped cauteries are also referred to by Hippocrates³ in the treatment of recurrent dislocation of the shoulder-joint.

JĀMBOVĀUSTHA PROBES

Three probes are called *Jāmbovāustha* for their ends are shaped like the fruit of Jambul tree (*Eugenia jambolanum*)⁴. Three other *śālākā* have their ends shaped like *ankuṣa* or elephant driver's goad⁵. They may be made of any length required.

¹ अष्टाङ्गना निम्नसुखा सिद्धं चारुषघ्नं क्रमे ।

कनीनी-मध्यमा, नामी-नखमान-समैर्मुखै ॥

Astāngar Hṛdaya Samhitā, I २२८

² *Paulus Aeginetæ*, VI 1२८

³ *Hippocrates* iii 15

⁴ See foot note 2, P 155

शलाका जाम्बवीष्टान चारुषघ्नी च पृथक् त्रय ।

युञ्ज्यात् स्थूलान् द्रौघाना,

Astāngar Hṛdaya Samhitā, I २२८

⁵ See foot note 2, P 155

For the diagram of the *ankuṣa* see Fergusson's Tree and Serpent Worship, Plate XXXIII. *Sinchi* XXXVIII fig 1 and XXXVIII fig 1 & 2

by the surgeon. These six varieties are recommended for the purpose of applying caustic medicaments and the actual cautery.

Paul¹ mentions a gamma-shaped cautery in the radical cure of hernia. This cautery is shaped like the Greek letter Γ , so it resembles the ankuśa cautery of the Hindus. The ankuśa is similar in appearance to the Greek letter

One variety, which is used for the purpose of removing a tumour from the interior of the nasal cavity, has its end shaped like a khala or mortar, with sharp edges, and of the size of half the stone of the fruit of the jujube tree (*Ziziphus jujuba*)². Vāgbhata³ mentions a similar probe for the purpose of applying actual cautery to a nasal tumour. Its end resembles in shape and size, a half of the stone of the fruit of the jujube tree.

This spoon-shaped probe of the Hindus is comparable to the cuvette like sharp cyathiscomele of the Greeks, noted before.

COLLYRIUM PROBES

For the purpose of applying collyria to the eyes, a rod is mentioned having the length of eight anguli and the thickness of a pea. Its both ends are shaped like buds⁴.

The probes for applying collyria to the eyelids, should be six anguli long, with a rounded bulbous end. They may be made of gold, or silver, or copper, or iron, or stone. For the habitual use of collyria, a lead probe is prescribed. When medicines are directed

¹ Paul, VI. lxx

² See foot note 2, P. 155

³ कीलास्थि दल तुल्या सा नासाग्री, बृंह दाहकम् ॥

Astāngar Hradaya Samhitā, I. 144

⁴ See foot note 2 P. 155

to be applied not only to the lids but also to the conjunctiva, the finger is recommended as it is a softer and safer instrument. Again the probes would vary according to the nature of the collyria to be used. As for the application of lekhana collyrium, the probe should be made of copper and should be ten anguli long. The probe is advised to be made thinner at its middle to afford a firm grasp by the surgeon. The ends are shaped like buds. For applying lopana collyrium, a similar probe is to be used, but it should be made of steel, while for the application of a collyrium for the improvement of the visual strength, a probe made of gold or silver, and having the size and shape of a finger is recommended by Cakradatta ¹

Suśruta² likes a probe of steel, or bell-metal, or copper for lekhana collyrium, and of gold, or silver, or horn, for lopana and snehana collyria. The probe should be eight anguli long, and the eye is to be kept open and fixed by the left hand, while the right hand is to hold the probe, and so the collyrium is to be applied to the eye.

¹ दशाङ्गुला तनुर्मध्ये शलाका सुकुलानना ॥

प्रशस्ता लेखने ताम्बी रोपणे काललोहना ॥

अङ्गुलीव सुवर्णोत्था रुप्यजा च प्रसादने ॥

Cakradatta Āschyotana Cikitsā

² तेषां तुल्यगुणान्येव विदध्याद् भाजनान्यपि ।

सौवर्ण्यं राजतं शङ्खान्ताम्रं वैदूर्यकास्यजं ॥

आयसानि च योन्यानि शलाकाश्च यथाक्रमम् ।

वक्रयोर्मुकुलाकारा कलायः परिसंश्लेषाः ॥

अष्टाङ्गुला तनुर्मध्ये सुकृता साधुनिगृह्णाः ।

श्रीङ्मुख्यस्मजातानि शारीरी वा हिता भवेत् ॥

Suśruta Samhitā VI 1711

Śārngadhara¹ says "The collyrium probe should be made of stone or metal. It should be eight anguli long and its ends must be made smooth and rounded like a common pea. For lekhana collyrium, a copper, or iron, or stone probe is to be used, while for ropana collyrium the tip of the finger is recommended for its softness."

Of the probes used by the Hindus for applying collyrium to the eyes, fortunately we possess a few specimens. Among the objects of interest found in the excavations at Bijnoi, we find, "fourthly, one copper salai or instrument for applying antimony to the eye, similar to those found in the Bihat excavations"²

¹ सुखयो कुण्ठिता श्लक्षा शलाकाष्ठाङ्गुलीन्मिता ।

अस्मज्जा धातुजा वा स्यात् कलायपरिमण्डला ॥

ताम्रलोहाम्बुसजाता शलाका लेखने मता ।

सुवर्णरजतोहूता शलाका स्नेहने मता ।

अङ्गुलीच मृदुत्वेन कथिता रोपणे बुधै ॥

Śārngadhara Samgraha III ५११

Yogarātnākṛta Eye Diseases P 823

त्रिफल सलिलयोगे भृङ्गराजद्रवे च

हविषि च विषकल्के जीरे अजे मधूये ।

प्रतिदिनमथ तप्त सप्तधा सीसमेक

प्रणिहितमथ पथ्यात् कारयेत् तच्छलाकाम् ॥

सवितुरुदयकानि साक्षना व्यञ्जना वा

करकरिकसमेतान्मर्षैश्चिच्छिरोगान् ।

असितसित ससुत्यान् सन्धिवर्त्ताभिजातान्

हरति नयनरोगान् सेव्यमाना शलाका ।

Cakradatta, Netraroga Cikitsā

* "Vide Princep's (Thomas') Indian Antiquities, fig 18 pl 1v" J A S B

Specillum with two olive ends formed a variety of probe of the Greek and Roman surgeons. It was used as an ordinary probe in dealing with crooked fistulæ, and as a cautery to destroy the roots of hairs after epilation. Sometimes it carried an eye in one of its olives and was used in the treatment of nasal polypus. The eye was threaded with a cord having many knots along it. The other end of the probe was pushed through the nose and withdrawn by the mouth, and then by a sawing movement of the cord with both hands of the surgeon, the polypus was removed.¹ A single probe for the application of semi-solid medicaments, occurs in the outfit of the oculist of Rheims in the museum at St. Germain-en-Laye and is figured by Milne.²

KARNA-SODHANA OR EAR-CLEANING

This Śalākī is said to have its end shaped like the end of a leaf of *Aśvattha* (*Ficus religiosa*). The instrument looked like a *śruva*—one of the famous spoons used in sacrificial ceremony.³ It was used for the purpose of extracting wax from the ears.

The different kinds of spoons used in the ancient Hindu ceremonies were as follows. "Three different *śruk* or offering-spoons are used *viz*, the *guhū*, *upabhit* and *drubha*. They are made each of a different kind of wood, of an arm's length (or according to others, a cubit long) with a bowl of the shape and size of the hand, and a hole cut through the bark and front

¹ Paul VI 133311, VI 133, VI 133.

² *Græco Roman Surgical Instruments*, pl. vi. fig. 5.

³ कर्णशोधनं मन्त्रस्य पत्रं प्राक्तं सुवाननम् ॥

side of the bowl and fitted with a spout, some eight or nine inches long and shaped like a goose's bill. The *surva* or dipping-spoon, on the other hand, chiefly used for ladling the clarified butter (or milk) from the butter vessel into the offering-spoons, is of the *khadra* wood (*Accacia catechu*), a cubit long, with a round bowl measuring a thumb's joint across and without a spout" ¹

So we see that the bowl of the *karna-sodhana* was round in shape

Suśruta also mentions a *śalākā* for the extraction of cerumen or minute insects from the ears.² *Cakrapāṇi*³ alludes to it. In modern times, the ear-cleaner, as used commonly in India, is a *tāla yantra*. Ear specillum is frequently mentioned by the Greeks and Romans. It consisted of a small narrow scoop at one end and a simple probe at the other. The use of the scoop is thus described by *Archigenes*⁴ "If a bean, stone, etc fall into the ear, remove it with the small narrow scoop of the ear specillum". *Celsus*⁵ directs us to extract a scab or cerumen by means of the ear specillum.

The ear scoop used by the modern surgeons is a narrow scoop, more like the Hindu *pupā* vessel known as *kuśi*. The ear scoop is often made in combination with a director.

¹ Śatapatha Brāhmaṇa, Sacred Books of the East 13 1 1 foot note

² See foot note 1, P. 149

³ क्लृदयित्वा तु तैस्त्रिंस्वैदेन प्रविलाय्य च ।

शोधयेत् कर्णगुह्यस्य भिषक् सम्यक् शलाकया ॥

Cakrapāṇi, Kairāṇīya

⁴ Galen XII, 652

⁵ Celsus VI viii

GAUMHĀ-SANET FETUS OR TRACTION HOOK

The end of this instrument is said to have been bent like ankura or elephant driver's goad. It is described to have the same length as the other Āmka have i.e. ten to sixteen anguli, and it is eight anguli in width.¹ It is recommended for extracting a dead fetus from the mother's womb, after perforating its head by the mandalāgr or mudrikā knife. Suśruta recommends us to perforate the head and then to extract the bones by the ankura or hook, and lastly to apply traction by fixing it about the chest or axilla. If the head can not be perforated, it is to be applied to the eye or cheeks.

Traction hook for extraction of a dead fetus was well known to the ancient Hippocrates² bids us break up the head of the fetus with a cephalotribe and remove the bones with bone forceps, or deliver it by a traction hook inserted near the clavicle. Celsus³ advises us to insert a smooth hook with a short point and to fix it in the eye, or the ear, or the mouth, or the forehead, and so the fetus is to be dragged down. Soranus points out the best places for the insertion of the hook to be the eyes, the occiput, the mouth, the clavicles, and the

¹ 'नतोऽयं शङ्कुना मृग्यो गर्भं शङ्कुरितिमृत्त ।

अष्टाङ्गना यतमेन मृदगमं जरेत् म्रिया ॥ १६ ।

Astāṅga Hṛdaya Samhitā I. xxx

² 'तमं निशमादाय मण्डलमिनाङ्गुलीशम्वज वा गिरोविदाय' शिर कपालान्याह्वय शङ्कुना गृहीन्दोरमि कलाया वापजरेदभिन्नं शिरमि चाक्षिफटे गन्धे वा ।

Suśruta Samhitā IV. xv

³ Hippocrates II. 70

⁴ Celsus VII. xxix

ribs in head presentations, and the pubes, ribs, and clavicles in footling cases ¹ Soranus, Aetius² and Paul³ direct us to extract the foetus in the same way but they recommend us to use two hooks instead of one, in order that the pulling may be straight down and not to one side

Albucasis,⁴ Rhases,⁵ Haly Abbas,⁶ and Avicenna⁷ give similar directions for opening the child's head and for delivering the foetus with hooks

This purpose in modern times is served by the blunt hook and notchet

YUJÑA-SĀNKU OF MIDWIFERY FORCEPS

An instrument is thus named and figured by modern writers on Hindu surgery, bearing some resemblance to the modern forceps, for extracting the child alive. We have, however, no mention of any such instrument in the works of Caraka, Suśruta, Vāgbhata and other ancient authorities. The Greeks and Romans were also ignorant of it, and the Arabians failed no better, though Adams, in his commentary on Paul⁸ asserts that Avicenna refers to forceps for the delivery of living children. Mulder, in his valuable work,⁹ gives an extract from a translation from the works of Avicenna supporting

¹ Soranus II xix

² Aetius IV iv 23

³ Paul VI lxxix

⁴ Albucasis Chirrug II 76 and 77

⁵ Rhases Cont xxii

⁶ Haly Abbas Pract ix 57

⁷ Avicenna iii 21, 1, 24

⁸ Paulus Ægineta III lxxvi

⁹ Historia Forcipum et Vecticum p. 6.

the same conclusion Smellie¹ says "With regard to the fillets and forceps, they have been alleged to be late inventions, yet we find Avicenna recommending the use of both. The forcep recommended by Avicenna is plainly intended to save the father." "He recommends all the old methods for assisting in natural labours, and if the woman can not be delivered by these he orders a fillet to be fixed over the head if that can not be done to extract with the *forceps*, and should these fail to open the skull by which means the contents will be evacuated, the head diminished, and the fetus easily delivered." Playfair² also holds the same view. The point is however by no means settled. For Milne³ says "A full consideration of Avicenna's words seems to me to lead to the conclusion that he is describing no more than extraction with a craniotomy forcep. If the forceps fail, the child is to be extracted by incision, as in the case of a fetus already dead (and decomposed so that the forceps would not hold)."

Thus we may be sure that there is no available evidence of the use of delivery forceps by the Hindus, Greeks, Romans and Arabs, and the Chamberlens are still the undisputed claimants to the glory of the invention.

But there is no doubt that the Hindu surgeons tried extraction of the living fetus by manual traction. The hands are recommended to be well oiled and introduced into the uterus. If the child be dead, sharp instruments are advised to be intro-

¹ Smellie Treatise on Midwifery, p. 10

² Ibid, Edited by McClintock. New Syd. Soc, vol. I. Introduction p. 50

³ Researches on Operative Midwifery, p. 10

⁴ *reco* Roman Surgical Instruments, p. 156

duced into the vagina for cutting upon the foetus. But on no account such instruments are to be used so long as the child is alive ¹

SARPA-FANĪ OR SNAKE'S HOOD

It is also called *agia-bakia*, i. e. the end bent. It is a *śanku* or hook similar to the above, the end being bent like the hood of a snake ². It is to be used for the purpose of extracting stone after operation.

Suśruta, in the operation for extraction of stone through the perineal incision, directs us to use the *agia-bakia* to bring the entire stone out of the wound. But in the case of females, he recommends us to use a knife having a spoon like a scoop, to prevent the formation of a vesicovaginal fistula ³. Is it a spoon-shaped knife, or is it a double instrument on a handle—a knife at one end and a scoop at the other? The Greeks used a knife having a scoop at the end.

¹ गर्भे जीवति मूढ तु गर्भं यत्नेन निर्हरेत् ।

हस्तेन सर्पिषाक्तो न योनेरन्तर्गतेन सा ॥

मृते तु गर्भे गर्भिण्या योनीं शस्त्रं प्रवेशयेत् ।

शस्त्रशान्त्तार्थं विदूषी लघुहस्ता भयोजिह्वता ।

सचेतनं तु शस्त्रेण न कथञ्चन दारयेत् ॥

Yogaratnāvalī, Muddhagaurā Cikitsā

² अश्रम्यार्थहरणं सर्पफणावद्वक्रं अयत् ॥

Aṣṭāṅga Hṛdaya Samhitā I १८४

³ यथा च न भिद्यते न चूर्ण्यते वा तथा प्रयतेन चूर्णमल्पमप्यवस्थितं हि पुनः परिदृष्टिमेति तस्मात् समन्तामयवक्त्रेणाददीत । स्त्रीणान्तु वक्षिपार्श्वगतो गर्भाशयः सन्निकृष्टः तस्मान्नासासुतसङ्गवच्छस्त्रं पातयेदतोऽन्यथा खल्वासा मूत्रस्त्रावीं व्रणो भवेत् ।

Suśruta Samhitā IV १॥

Celsus¹ describes the extraction of stone through a perineal section by means of the lithotomy scoop. "The scoop is slender at the end and flattened out in the shape of a semi-ellipse, smooth externally where it comes in contact with the tissue, rough internally where it meets the calculus." It was a long hook-like instrument.

Aetius² mentions a special stone extractor, under the treatment of calculus in the female. Some understand by it the lithotomy forceps.

In modern times we use the lithotomy forceps and scoop for the same purpose.

I take this opportunity of referring to the celebrated passage in the famous Hippocratic oath, which runs as follows. "I will not cut persons labouring under the stone, but will have this to be done by men who are practitioners of this art." This sentence has given a good deal of trouble to the commentators and they have failed to understand the true reasons as to why Hippocrates specially forbade the practice of this operation. "M. Littié finds some difficulty in accounting for the circumstance that the novice in surgery is interdicted from the operation of lithotomy." Adams,³ commenting on the sentence, says "Why this operation was proscribed, can not indeed be satisfactorily ascertained," and he quotes the Arab Physician, Avenzoar⁴, who "pronounces the operation to be one, which no respectable physician would witness, and far less to perform."

¹ Celsus vii. xxvii.

² Aetius IV. iv. 91.

³ The Genuine Works of Hippocrates Vol. II. P. 777—8.

⁴ Avenzoar II. 2, 7.

duced into the vagina for cutting upon the fœtus. But on no account such instruments are to be used so long as the child is alive ¹

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¹ गर्भे जीवति मृद तु गर्भं यत्नेन निर्हरितुम् ।

हस्तेन सर्पिषाक्तेन योनिरन्तर्गतेन सा ॥

मृते तु गर्भे गर्भिण्या योनौ शस्त्रं प्रवेशयेत् ।

शस्त्रशाम्बार्धविदूषी लघुहस्ता भयोजिह्वता ।

सचेतनं तु शस्त्रेण न कथञ्चन दारयेत् ॥

Yogarātnākara, Muddhagārva Cikitsā

² अश्रम्याह्वयं सर्पफणावद्वक्रं शयत ॥

Aṣṭāṅga Hṛdaya Saṁhitā I २२२

³ यथा च न भिद्यते न चूर्णं ते वा तथा प्रयत्नेन चूर्णमन्यमप्यवस्थितं हि पुनः परिहर्हिमिति तस्मात् समन्तामयवक्त्रेणादृष्टीत । स्त्रीणामु वक्षिपार्धगतो गर्भाग्न्यः सन्निकृष्टः तस्मान्नः सामुतसङ्गवच्छस्त्रं पातयेदतोऽन्यथा खल्लाप्ता मूत्रसावी ग्रथी भवेत् ।

Suśruta Saṁhitā IV २११

Celsus¹ describes the extraction of stone through a perineal section by means of the lithotomy scoop "The scoop is slender at the end and flattened out in the shape of a semi-circle, smooth externally where it comes in contact with the tissue, rough internally where it meets the calculus" It was a long hook-like instrument

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I take this opportunity of referring to the celebrated passage in the famous Hippocratic oath, which runs as follows "I will not cut persons labouring under the stone, but will have this to be done by men who are practitioners of this art" This sentence has given a good deal of trouble to the commentators and they have failed to understand the true reasons as to why Hippocrates specially forbade the practice of this operation "M Littié finds some difficulty in accounting for the circumstance that the noviciate in surgery is interdicted from the operation of lithotomy" Adams,³ commenting on the sentence, says "Why this operation was proscribed, can not indeed be satisfactorily ascertained," and he quotes the Arab Physician, Avenzoar⁴, who "pronounces the operation to be one, which no respectable physician would witness, and far less to perform"

¹ Celsus viii 222

² Aetius IV iv 94

³ The Genuine Works of Hippocrates Vol II P 777—8

⁴ Avenzoar II 2, 7

The explanation that this was proscribed because there were men who devoted themselves exclusively to this kind of treatment, and that if the qualified surgeons be allowed to practise the operation, they would interfere in the sphere of action of the lay lithotomists, cannot be considered satisfactory. For the question still remains the open one, why should Hippocrates proscribe this operation from the domains of scientific surgery, simply because a few laymen happened to practise it.

The real explanation is that in Hippocrates' time success in the operation was very difficult to achieve, consequently he interdicted the operation much in the same way as abdominal operations were considered sacred before the days of antiseptic surgery. It is curious to find that Suśruta calls this operation the worst of all surgical operations, for he says¹ "Even experienced and able surgeons fail to attain success by operation for the stone. So the surgical treatment is the worst of all treatment here. But if you do not operate, the patient will die, and it is doubtful whether he will live after the operation, so give him the chance of operation in God's name." I do not know whether this passage of Suśruta has any causal relation to the remarks of Hippocrates, but there is no doubt that the former serves as a better commentary on the latter, than anything hitherto suggested.

Adams² says that this operation was practised by a class of men,

¹ कुशलास्यापि वेद्यस्य यत सिद्धिरिहाम्नुवा ।

उपक्रमो जघन्योऽयमतः स परिकीर्तितः ॥

अक्रियायां भ्रुवो मृत्युः क्रियायां सङ्गो भवेत् ।

तस्मादापञ्च्य कर्तव्यमीदृशं साधूकारिणा ॥

Suśruta Samhitā IV vii

² Commentary on Paulus Ægineta Vol II P 363

separate from the surgeons, in all countries in ancient times, and points out that the ancient operation of lithotomy is still practised with great success by the native doctors of Hindustan. No conclusion is, however, to be drawn from the modern practices in India, as we find separate classes of men not only for stone, but also for bone-setting, extract, etc. And whatever may be the practice in modern times we find that during Suśruta's time, the operation was not the privilege of the laymen.

ŚĀTĀPĀNKA-MUKHA PROBI

This instrument is also described to have its end bent like the hood of a snake. It is four anguli long and is recommended to be used for the purpose of extracting a tooth from its socket.¹

Tooth elevator or instrument for levering teeth is mentioned by Galen.² It is of the same size as the bone lever which, according to Paul,³ is seven or eight anguli long.

This instrument resembles in shape and action the tooth elevator of the modern surgeons.

ARDHACANDRA-MUKHA ŚĀTĀ HALF-MOON PROBI

The first half of this variety of Śāṭā is curved like a half-moon, to which is attached the second half as a rounded handle.⁴ Suśruta advises us to use it for the purpose of applying actual

¹ शङ्खपुटसुखं दन्तपातनं चतुरङ्गुलम् ॥

Astāṅga Hṛdaya Samhitā I xxx

² Galen xvm 593

Paulus Aegineta VI lvi

³ शङ्खाकामन्त्रवर्त्मनि ।

सज्योऽहं पक्षदण्डात् सन चाङ्गुलसन्निभा ॥

Astāṅga Hṛdaya Samhitā I xxx.

cautery to the groin in bubonecele, to prevent the hernia from entering into the scrotum ¹

A crescent-shaped cautery was also used by the Greek and Roman surgeons So Paul² says that in cases of sloughing of the prepuce we must cut it off and use lunated cauteries to stop hæmorrhage and prevent the spreading of the wound Again he mentions a cautery shaped like the Greek letter Γ, in the radical cure of hernia ³

BONE LEVER

Instruments for levering fractured bones into their proper positions are mentioned several times by Suśruta In the treatment of fracture of the nasal bones, a śalākā is recommended to be used as a bone lever for raising and depressing the fractured ends ⁴ Sometime a musala or pestle is advised to be used ⁵ It is a thick wooden pestle the end of which is plaited with non It is still used to strike upon paddy to separate the husk from the rice Suśruta mentions its use to reduce dislocations of the joints of the shoulder and neck ⁶

¹ तव या वङ्गणस्या ता दहेदङ्गन्दुवक्रया ।

सम्यग्मार्गावरोधार्थं कोशप्राप्ता तु वर्जयेत् ॥

Suśruta Samhitā, IV १११

² Paulus Ægineta VI १११

³ Ibid VI १११

⁴ नासा सन्ना विष्ठत्ता वा ऋज्वी कृत्वा शलाकया ।

Suśruta Samhitā, IV १११

⁵ सन्नसुन्नमयेत् खिन्नमज्जकम् मूषलेण तु ।

तथोन्नतं पीडयेच्च वध्नीयाद्वाटनीव च ॥

Ibid

⁶ तैलपूण कटाहे वा द्रोण्या वा शययेन्नरः ।

मूषलेनोत्क्षिपेत् कलामाससन्धीं विसहते ।

स्थानास्थितश्च वध्नीत स्वस्तिकेन विचक्षणः ॥

Ibid

The pestle was also used by Hippocrates¹ to reduce dislocation of the shoulder joint. He says "Those who accomplish the reduction forcibly bending it round a pestle, operate in a manner which is natural. But the pestle should be wrapped in a soft shawl (for thus it will be less slippery), and it should be forced between the ribs and the head of the humerus. And if the pestle be short, the patient should be seated upon something, so that his arm can with difficulty pass above the pestle. But for the most part the pestle should be longer, so that the patient when standing may be almost suspended upon the piece of wood. And then the arm and forearm should be stretched along the pestle, whilst some person secures the opposite side of the body by throwing his arms round the neck, near the clavicle."

The bone lever used by the Greeks is thus described by Paul² "It is an instrument of steel about seven or eight fingers' breadth in length, of moderate thickness that it may not bend during the operation, with its extremity sharp, broad and somewhat curved."

DIRECTOR

Suśruta³ mentions the use of esanī or metallic probes not only to ascertain the course of the fistulous track but also to raise the bridge of skin covering the sinuses, so that the surgeon may operate on it as a guide. Cakradatta⁴ also uses a probe to

¹ The Genuine Works of Hippocrates Adams' Trans p 372

² Paulus Aeginetæ, V 1 cv

³ पक्षेषु चोपस्त्रिगुणमवगाहस्त्रिगुणं शय्याया सन्निवेशार्थमिव यन्त्रयित्वा भगन्द् सनीच्य पराचीनमवाचीन वा वहिर्मुखमन्तर्मुख वा ततः प्रणिधायैषणीमुन्नम्य साशयमुदरेच्छस्त्रेण
Suśruta Samhitā, IV viii

⁴ नाडीनां गतिमन्विष्य शस्त्रेणापाह्य कर्मवित्।

Cakradatta, Nādirvāpa Cikitsā.

learn the direction of the wound before operation. It is also mentioned in the *Yogatnāka* ¹

In the treatment of fistulæ, Celsus ² also says "A director being inserted into them down to their termination, the skin ought to be incised." It is not mentioned that the *esanī* or probe was grooved, but there is no doubt of its use like a grooved director, so common nowadays. The discovery of such a director, along with several other surgical instruments, which are preserved in the Musée de Cinquantenaire, Brussels, proves that it was known to the Romans.

URETHRAL PROBE

A variety of *salākā* is described by *Suśruta* ³ to have its end rounded like the stalk of a *mālatī* flower (*Echites caryophyllata*, Rox.) It is to be used for cleaning the urethral canal.

Caraka ⁴ mentions a probe for examining the direction of the urethral canal and its pathological condition, before introducing the tube of the urethral or bladder clysters into it.

¹ नाडीना गतिमन्वीक्ष्य शस्त्रे षोडशाक्ष्य कर्म्मवित् ।

Yogatnāka, p. 346

² Celsus, VII. 11

Græco Roman Surgical Instruments p. 73

³ सूत्रमार्गविशोधनार्थं एकं मालनीपुष्पहन्तायप्रमाणं परिमण्डलमिति ।

Suśruta Samhitā, I. 111

⁴ ऋजो मुखोपविष्टस्य दृष्टे मेद्रे घृतान्विते ।

शलाकयान्वित्य गतिं यद्यप्रतिष्ठतां व्रजेत् ॥

ततः शिफ प्रमाणेन पुष्पनेत्रं प्रवेशयेत् ॥

Caraka Samhitā, VIII. 11

Class VI. The Upayantra or Accessory Instruments.

The sixth class of the blunt instruments comprises the upayantra or accessory instruments. By surgical instruments, the Hindus consider not only the instruments proper, but also any mechanical aid by which the object of the surgical treatment is attained. Thus even medicinal agents are considered under this head for they help the inflammatory swellings to subside, or suppurate, or burst open as by various external applications. The accessory instruments are

1 RAYIC OR THREAD

As an example of thread being used as an instrument of surgery, we know that the thread smeared with caustics are recommended by Suśruta¹—kṣāia sūtra or caustic thread—for the operation of fistula-in-ano. For further informations on the subject see “E-anī or sharp probes” under the Śastra.

Thread as a material of phalavānta or tent is mentioned by Śaṅgadhara². If after a vaginal or intra-uterine douche, the injection does not flow out, he advises us to introduce a strong tent made of thread, dipped in oleaginous medicines of the

¹ कृशदुर्बलभीरुणा नाडीसंस्मयिताच्च या ।

चारमुखेन क्लिद्यान्नतु शस्त्रेण वृद्धिमान् ॥

Suśruta Samhitā, IV, ११०

Cakradatta, Nāḍīvarga Cikitsā

² फलवर्त्ति, निद्रध्याहा योनिमार्गे दृढ भिषक् ।

सूत्रैर्विनिर्मिता सिग्धा शोधनद्रव्यसयुताम् ॥

Śaṅgadhara Samgraha, III १०

sodhana (Purifier) group Cakradatta¹ uses caustic threads in the treatment of piles by ligature

2 VEṆIKĀ OR TWINE

The use of twine as a ligature to be applied above the part bitten by a snake to arrest the circulation of blood towards the heart is mentioned by Suśruta² Caraka³ also advises us to tie ligatures above and below the bitten part, then to squeeze out the poison towards the wound, whence it is to be drawn out through incisions made by a knife

3 PĀTṬA OR BANDAGES

For the proper application of bandages, Suśruta mentions the following materials to be necessary⁴ viz., cloth manufactured

¹ भावित रज्ज्वनीचूर्णं, मृहीचीरे पुन पुन ।

वन्धनात् सुदृढं स्रुतं मिनत्तपशो भगन्तर ॥

Cakradatta, Arśāroga Cikitsā

² सा तु रज्जादिभिर्वद्धा विषप्रतिकरीमता ।

Suśruta Samhitā, V १

³ दशत तु विष दष्टस्य विस्तृतं वेणिका भिषक् वद्धा ।

निष्पीडयेदभ्यश्च दशमुद्धरेन्मर्मा वर्ज्यम् ॥

Caraka Samhitā, VI १११

⁴ अत ऊर्ध्वं व्रणवन्धनं द्रव्याण्युपदेक्षामः । तदथा चौमकार्पासविकटुकूल कौशेय पद्मैर्ण चीनपद्मचर्मन्तर्ज्वल्लालावृश्कललता विदलरज्जुतूलफलसन्तानिका लौहानीति तेषां व्याधौ कालं चावेद्योपयोगं प्रकरणतश्च धामादेशः । तत्र कोशदामस्वस्तिकानूवेक्षितप्रतोलौ मण्डलस्थगिकाग्रमकखट्वाचीनविवन्धवितानगोफणा पञ्चाङ्गी चेति चतुर्दशवन्धविशेषाः ।

तेषां नामभिरेवाकृतं प्रायेणव्याख्याताः । तत्रकोशमण्डुष्टाङ्गुलिपर्वसु विदध्यात् । दामं सन्धाघ्रेऽङ्गे । सन्धिकर्षकभूस्तनान्तरतलकर्णेषु स्वस्तिकः । अनुवेक्षितानु शाखासु, । ग्रीवामेन्द्रयोः प्रतोलौ । हस्तेऽङ्गे मण्डलः । अङ्गुष्ठाङ्गुलिमेन्द्रग्रेषु स्थगिका । शमलव्रणयोः र्यमकः । हनुशङ्खगण्डेषु खट्वा । अपाङ्गयोश्चीनः । पृष्ठदरीरसु विवन्धः । सूईणि विताना चित्रकनासौष्ठाः स्वस्तिषु गोफणाः । अवुण्णकङ्के पञ्चाङ्गीमिति । 'यो वा यस्मिन् शरीरे प्रदेशे सुविविष्टो भवति तं तस्मिन् विदध्यात् ।

Suśruta Samhitā, I १४१

from the fibres of plant fibres cotton, wool, blankets, silk, leather, Chinese cloth, inner bark of tree, bark of bottle gourd (Cucurbitaria), a tender of axillary plant, cane or piece of split bamboo, goat hair, the cocoon of *Bombax Malabaricum*, blades of bamboo, and plates of metals as gold, or lead, or iron. These are to be selected with due consideration as regards the nature of the lesion, the time of their use, and the purpose intended. Here are the fourteen varieties of bandage as follow —

1. *Karmāṣṭhā* — a long extender or cloth to be applied to the ends of the thumb and finger. The form of bandage is to be applied over the stump after amputation of the hand.

2. *Pratibandha* or a padded one — it is a large bandage to be used especially for the relief of pain or cramps.

3. *Saṁskṛṣṭa* or an adhesion bandage — it is to be applied over the point of the space between the tendons of the great and second toe, the intertarsal region, the glabella (space between the eyebrows), the plantar surfaces of the feet, the palmar surfaces of the hands, and the ear. It is also the form of bandage recommended in dislocation of the shoulder joint.

4. *Anuvellita* or an encircling bandage — it is to be applied to the limbs. This form of bandage is recommended to be applied to the limbs in cases of oblique deep and large cuts inflicted by a knife. A leather bandage applied in the form of *gophanū* would also serve the purpose. The encircling bandage is also advised in cases of fracture of the ribs.

5. *Pratoli* — a broad bandage for the neck and penis.

6. *Mandali* or a circular bandage — it is to be applied to

the round parts of the body such as the arms, sides, abdomen, thighs, and back

7 Sthagikā or a supporter — a bandage enclosing a splint and pastes of medicaments to keep the parts firm. It is to be applied over the ends of the thumb, fingers, and penis. Suśruta directs us to use this bandage round the scrotum after tapping the hydrocele.

8 Yamaka or a double-bandage — a pair of encular bandages applied to a couple of ulcers on a part.

9 Khatvā or a four-tailed bandage — it is recommended for the temples, cheeks and lower jaw.

10 Chīna or a banner bandage — a bandage for the inner angles of the eyes.

11 Vivandhana or a encular chest-bandage — it is the bandage for the back, abdomen and chest.

12 Vitāna or a canopy bandage — a large bandage for the head.

13 Gophaṇī¹ (lit a sling for throwing stones) — a concave bandage for the chin, nose, lips, shoulders and pelvis.

¹ शाखासु प्रतिता नित्यक् प्रहारान्विहतान् भृश ।

सील्येत सम्यग्निवेश्याग् सम्यस्थीन्यनुपूर्वञ्च ॥

वद्वा वेन्नितकेनाग् ततस्तेल्लेन सेचयेत् ।

चर्मणा गोफणावन् काथ्यो ग्रीवा हितो भवेत् ॥

Suśruta Samhitā, IV 11

पादौ निरस्नमुपस्य जनैर्न प्रोक्ष्य चालिणी ।

प्रवेश्य तुद्वर्गवत्या मुक्ती मीवितत पर ॥

काथ्यो गोफणिवावन् कश्चाज्जाविश्य पन्नक ॥

Ibid, IV 11

14 Pañcāṅgī or a five-tuled bandage¹ — it is intended for the parts above the clavicle, as in the dislocations of the lower jaw. Caraka² mentions a bandage called kavalikā, to be tied tightly after setting a fracture or reducing a dislocation. It is so-called from the medicinal paste which is applied to the affected parts, underneath the splints.

Dunghison mentions a bandage called Accipitari to be applied over the nose. It is so called from its likeness to the claws of a hawk. It resembles the pañcāṅgī bandage of the Hindus.

So the bandages are recommended to vary according to the different parts of the body, and the surgeon, using his discretion, is to select the form of bandage suitable to the part. The bandages are recommended to be firmly secured to their place by three strings, applied upwards, downwards and obliquely. The knot is avoided over the seat of ulcer and tied on a side.

Suśruta says: "Bandages are applied with three degrees of tightness according to the seat of the abscess — 1. A tight bandage causes uneasiness but not actual pain, 2. A loose bandage is loose and relaxed, 3. An even bandage is properly applied—neither tight nor loose. The tight bandage is to be applied to the buttocks, sides of the abdomen, axilla, groin, chest and head. The eyes and joints

¹ हन्वस्थिनी समानीय हनुसन्धौ विसहते ।

खेदयित्वा स्थिते सम्यक् पञ्चाङ्गी वितरेन्निषक् ॥

Suśruta Samhitā, IV. 111

² अस्थिभग्नं च्युतं सन्धिं सदधीत समं पून ।

समीनं सममङ्गेन कृत्वान्येन विचक्षण ॥

स्थिरे कवलिकावर्धं कुशिकाभिश्च सस्थितम् ।

पटे भूतं सर्पिकैर्वध्नीयादवनं सुखं ॥

Caraka Samhitā, VI. 111

are loosely bandaged. The even bandage is for the extremities, face, ears, neck, penis, scrotum, back, sides, and abdomen."¹

Susruta next deals with the alterations in the mode of applying bandages according to the rules laid down. He also advises the surgeon to be guided by the dictates of his common sense. He directs us to practise bandaging on the various large and small limbs of a human figure made of cloth or clay.²

With regard to the mode of application of bandages, Hippocrates says.³ "It should be done quickly, without pain, with ease and with elegance, it should fit well and neatly. The forms of it are the simple, the slightly winding (called asen), the sloping (sama) the monoculus the rhombus, and semi-rhombus".

The whole chapter of Susruta is very interesting and will repay perusal. If bodily transferred, it will adorn any modern text book on surgery.

As it is very difficult to convey a correct idea of these bandages in words, I have given figures of them from modern works on surgery, from which then construction and uses will be readily understood at a glance.

¹ सप्त व्रणायनविधिषाद्वय विमोक्षविधी भवति नाट समं विधिषा इति ।

पीड्यस्तुभी गाढः सोष्मास, विधिषा, १५४ ।

नीच गाढी म विधिषा, समोवध' पञ्चोक्तिः ।

तथ स्त्रिष् कचि कथा हणोर भिर' समादः । आर्यावदन कर्षकालभेदकुण्डलपयो-
दरसुप्त समः । अयोः सन्निधु प विधिषा इति ।

Susruta Samhitā I xviii

² पुरुषस्य पुरुषाहं पुरुषविमर्षिषु अयोवध' ।

Ibid I xv

³ The Genuine Works of Hippocrates. Vol II P 377 See Ed

ABDOMINAL BINDER

Caraka¹ mentions the use of abdominal binder for the recently delivered woman to prevent derangement of air by its expansion in her abdomen.

Dr. Barnes says :² "The sudden expulsion of one-tenth of the body-weight from the abdominal cavity is attended by a sudden removal of a force hitherto pressing upon the vessels and organs of the chest, abdomen, and pelvis. This entails in some cases a tendency to vacuum. Hence disturbance of the circulation. Now the binder, by supporting the abdominal walls, restores the equilibrium of pressure. The pressure exerted upon the uterus works as a gentle continuous stimulus to contraction. The woman is conscious of the support and is grateful for it."

The figure, so precious, and rightly so, to women, is better preserved. So applied, the binder becomes one of the most efficient agents in antiseptic midwifery, it keeps the walls of the uterus and vagina in contact, thus preventing the collection of fluids or clots, and shutting out air."

The use of cloth for other surgical purposes is also mentioned —

FIELD HOSPITAL

The cloth is to be used for the manufacture of tents for the doctors to live in. The wounded in war are to be treated in such tents. The tent of the surgeon-general should be close to that of the king in the battle-field.³

¹ वैद्ययेदुदग् मृता वाससा तथा तस्या न वायुरुदरे विकृतिमुत्पादयत्यनवकाशत्वात् ।

Caraka Samhitā, IV viii

² Obstetric Medicine and Surgery Vol II p 87

³ स्कन्धावारे च मृति राजगैहादनन्तर ।

भवेत् सन्निहितो वेद्य, सर्वोपकरणान्वित, ॥

Small tents are also recommended for applying vapour bath to patients

DRESSINGS

Dīdhavala¹ mentions the use of medicated gauzes to be used as sponge by the females and says "In discharges from the vagina, pieces of cloth soaked in decoction of barks of Vata (*Ficus Bengalensis*) and Lodha (*Symplocos racemosa*) and dried, should be put inside the canal "

In the Mohāvāgga² we find the use of itch-cloth — "I allow, O Bhikkhus, to whomsoever has the itch, or boils, or a discharge, or scabs, the use of an itch-cloth"

"According to the 90th Pakittiya such cloth must not be more than four spans in length and two in breadth "

I can not help quoting from Mohāvāgga,³ another discourse of Buddha as it shows clearly the surgical treatment of boils in ancient times —

Now at that time a certain Bhikkhu had boils

"I allow, O Bhikkhus, the use of the lancet"

Decoctions of astringent herbs were required

"I allow, O Bhikkhus, decoctions of astringent herbs"

Sesamum salve was required

तदस्थमेन ध्वजवदश ख्याति समुच्चिता ।

उपसर्पन्त्यमोहेन विषशल्यामयर्दिता ॥

Suśruta Samhitā, I xxxiv

¹ न्ययोधत्वक् कषायेण लोपकत्स तथा पिबेत् ।

आस्त्रावे क्षौमपट्ट वा भावित तेऽनुधारयेत् ॥

Caraka Samhitā, VI xxx

² Mahāvāgga VIII 17, 2

³ Ibid VI 14, 4 & 5

"I allow, O Bhikkhus, the use of sesimum salve"

5 Compresses were required

"I allow O Bhikkhus the use of compresses"

It was necessary to tie up the sore with cloth

"I allow O Bhikkhus, the use of bandages for tying up wounds"

The sore itched

"I allow you, O Bhikkhus, the sprinkling of a sore with mustard-powder"

The sore became moist

"I allow you, Bhikkhus, to fumigate (the sore)"

Proud flesh formed on the wound

"I allow you, O Bhikkhus, to cut off (proud flesh) with a lancet"

The wound would not close up

"I allow, O Bhikkhus, the use of oil for wounds"

The oil ran over

They told this thing to the Blessed One

"I allow, O Bhikkhus, the use of fine rags, and of all kinds of ways of treating wounds"

If the object of fumigating the sore was to sterilize it, as it certainly was, we may take this dialogue as the best sketch of the scientific treatment of boils,—remembering that it represents the knowledge of surgery more than 2500 years ago

Cikrapāṇi advises us to tie the ends of the hairs of a patient, by a piece of cloth,¹ before performing phlebotomy on the vessels of the head and neck

¹ मृदुपट्टात्तकेशान्नी जानुम्यार्पितकर्पर ।

4 CARMA OR LEATHER

The use of leather in ancient medical practice in India was manifold

Leather bandage

Straps or belts of leather were used as bandages. Suśruta¹ advises us to apply the leather bandage in cases where more than half the thickness of the upper or lower extremities are cut by some sharp instruments in a slanting direction. Then the parts of the wound should be well adjusted, the bone and the soft parts kept in apposition, and the wound closed by sutures and well covered by dressings, over which the leather bandage is to be applied in the form of a gophanā or sling.

Leather bandage in the form of gophanā is mentioned by Suśruta² to be applied over the anus to prevent recurrence of pro-cidentia of the rectum. The prolapsed bowl should be well bathed with ghee and fomented, and then reduced by gentle pressure. There should be a hole in the bandage just in front of the anus to allow flatus to pass out. Vrnda³ alludes to it. Similarly the modern surgeons use a pad supported by a bandage as an aid in

¹ See foot note 1, P 178

² गुदभ्रंशे गुद स्त्रिन्न स्नेहाभ्यक्तं प्रवेशयेत् ।

कारयेद्गोर्फणावन्धं मध्यच्छिद्रेण चर्मणा ॥

Suśruta Samhitā, IV ५५

³ गुदभ्रंशे गुद स्नेहैरभ्यज्याऽगुं प्रवेशयेत् ।

प्रविष्टं स्वेदयेच्चापि बद्धं गो फणया भृशम् ॥

गो फणयेति । गो फणा बन्धविशेषः ।

उक्तं हि — उच्चारनिर्गमाय मच्छिद्रेण चर्मणा चास्य गो फणावन्धं काथ्य इति ॥

preventing descent of the part. It is mentioned also in the *Cikradatta*¹ and the *Yogvatnākarn*.²

Dr̥dhavāda mentions the use of a piece of untanned leather to be applied over a piece of ointment during the day, while during the night the leaf of *Pradu* (*Ricinus communis*) is directed to be used.

LEATHER LIGATURES

In the treatment of snake-bite a ligature is advised to be used above the seat of injury to stop the circulation of poisoned blood. This ligature is advised to be made of leather, or braided fibres of tree or sif cord of jute, etc.³

YAMH-SĪTAVA LIGATURE OR SHARP OR BINDING APPARATUS

This is the name of the leather shackle, which is recommended to be used during the operation for stone in the bladder. The patient should flex his knees and draw up, and the parts are to be

¹ गुदभाजं गुदस्य चक्रायामुपप्रतिष्ठत ।

प्रतिष्ठेद्वेदेद्विषासि यदा गोष्मण्यथा दृष्टम् ॥

Cikradatta, Ksudhraroga Cikrātā

² गुदभाजं गुदस्य चक्रायामुपप्रतिष्ठत ।

प्रतिष्ठेद्वेदेद्विषासि यदा गोष्मण्यथा दृष्टम् ॥

Yogvatnākarn P 313

³ पुरुषपदे प्रस्थाप्य रातो कायं विनोदयेत् ॥

धीगम्भ्या तत मित्रं पुनर्द्वयोपपातितम् ।

मुञ्चन्नादौ दिशामउ चर्माभिय सुलोमभि ॥ ८४ ।

Charaka Samhitā, VI xxviii

⁴ सर्व्वेवाहितं सप गात्रादहस्यं देहि न ।

दृग्मोपरि वधीयादृष्टिदत्तुराहुनि ॥

प्रीतचर्माल्ल-वन्कानां सृष्टनान्यतमेन च ।

न गच्छति विषं देहमृष्टाभिनिवास्ति ॥

Susruta Samhitā, V v

ties together by this instrument¹ Similarly, it is to be used during the operation for piles, but then, according to Suśruta,² the neck and thighs are to be tied by the instrument which is to be held firmly by the assistants Vāgbhata³ uses cloth instead of leather

Yantra-sātaka is also to be used during the operation of phlebotomy Suśruta says⁴ "If venesection is required to be done, the patient is to be seated on a stool, an aratni high (from the elbow to the end of the little finger), facing towards the sun The thighs are to be flexed, the two elbows to be placed over the knees, and the hands (the fingers being clenched into fists) to be fixed on the two sides of the neck The two ends of the shackle which pass over the fists, are held up at his back by the left hand of an assistant, who with his right hand steadily (neither forcibly nor loosely) presses above the part selected, to make the veins prominent, and at the same time rubs on the back to

¹ सङ्कुचितजानुकर्पूरमितरेण सहाववद्ध सूत्रेण शटकैर्वा ।

Suśruta Samhitā, IV vii

² वस्त्रकम्बलकोपविष्ट यन्त्रशटकेन परिचिप्त योवासकथपरिकर्म्मिभि सुपरिगृहीत-
मस्पन्दनशरीरं कृत्वा ।

Ibid, IV vi

³ अथ यन्त्रेण वाससा ।

सकथौ शिरोधराप्राञ्च परिचिप्त सजुस्थितम् ॥

Astānga Hṛdaya Samhitā, IV viii

⁴ तत्र व्यव्यसिर पुरुष प्रत्यादित्यमुखमरद्विसाञ्चोच्छिन्ने उपवेश्यासने सकथौराकुञ्चितयो-
र्निवेश्य कर्पूरसन्निवृत्त्योपरि हस्तावन्तर्गूढाङ्गुष्ठकतसुष्टौ मन्ययो स्थापयित्वा यन्त्रशटक
शीवासुध्योरुपरि परिचिप्यान्वेन पुरुषेण पश्चात्स्थितेन वानहस्तेनोत्तानेन शटकान्तर्द्वयं यादयित्वा
ततो वैद्यो ब्रूयाद्दक्षिणहस्तेन शिरोत्यागनाय नात्यागतगियिल यन्त्रमावेष्टयेत्यसृक्स्नावणाय
यन्त्रं पृष्ठमग्रे च पीडयेति कर्म्मगुरुपञ्च वागुत्पमुखं स्थापयेदेष उत्तमाङ्गगतानामन्तर्मुख-
वज्यानां सिराणां व्यधेन यन्त्रणविधिः ।

stimulate bleeding, the patient being then told to inflate his mouth with air forcibly. This is the method of binding for puncturing the veins of the head except those (veins) which have their mouths turned inside the body." Vāgbhata describes a similar procedure in bleeding from the vessels of the neck¹

The Greeks also used ligatures to tie up the arms and legs of a patient in the lithotomy position. Paul² says "In operating, the woman should be placed on a seat in a supine posture, having her legs drawn up to the belly, and her thighs separated from one another. Let the arms likewise be brought down to her legs and secured by proper ligatures about the neck."

In modern times, similarly, we use lithotomy straps or crutch, after placing the patient in the lithotomy position during the operation of lithotomy and excision of piles.

PAŚA

This is a different shackle to be used for binding insane persons³

¹ अग्नितापातपक्षिग्धो जानूच्चासन सस्थित ।

सृष्टपश्चात्तकोशान्तो जानुस्थापित कूर्पर ॥

*सृष्टिभ्या वस्त्र गर्भाभ्या मन्ये गाढ' निषीडयेत् ॥

Astānga Hrdaya Samhitā, I १८११

² Paul VI १८११

³ भीमाकारैर्नर्गैर्नागैर्दान्तेर्व्यालैश्च निर्व्विधै ॥

भीषयेत् सतत पाशे कशाभिर्व्वीथ ताडयेत् ।

यन्मथित्वा सुषुप्त वा चासयेत्त' दृष्टाग्निना ।

Suśruta Samhitā, VI १८११

ABDOMINAL BINDER

The use of cloth binder has been described before¹ Leather binder is to be used after the operation of paracentesis abdominis to apply pressure over the abdomen After draining the fluid of ascites, the abdomen of the patient should be well wrapped with blankets, or silk cloth, or leather binder, for then the abdomen would not be flatulently distended by air²

LEATHER BAGS

The use of leather in the formation of bags of the vasti-yantra has been described before³

ŚĪRO-VASTI LEATHER BAG FOR THE HEAD

For application of oil on the head, Suśruta⁴ directs us to use a goat's bladder filled with medicated oil, just in the same way as ice bags are used nowadays

Śārngadhara⁵ describes another variety of śīro-vasti "It is

¹ See P 181

² निक्षुनेच दीधे गाढतरमाविक काशिय चर्मरामण्यतमेन परिवेष्टयेदुदरं तथा नाभापयति वायु ॥

Suśruta Samhitā, IV 211

³ See P 129 30

⁴ ऋज्वासीनस्य वल्लीयाद् वस्त्रिकोषं ततो दृढं ।

Ibid, VI 2711

⁵ शिरोवस्तिविधिरात्र प्रोच्यते सुज्ञसम्मतः ।

शिरोवस्तिश्चर्मणः स्नादिसुखो ह्यदृशाङ्गुलः ॥

शिरःप्रमाणं तं बद्ध्वा नस्यके नापिपिठकैः ।

सन्निरोधन्विधायादौ स्नेहं कोष्णे प्रपूरयेत् ॥

तावत् धार्यस्तु यावत् स्नादासनैश्च सुखञ्जति ।

दिद्वेनोपयसो वापि भावाणां वा रुद्धकम् ॥

Śārngadhara Saṅgraha, III 21

made of leather, has a length of twelve anguli and has two orifices or mouths. The leather bag is to be well tied round the head, the junction of the circumference of the bag and the skin should be well pasted with māśa (Phaseolus Rox) glue. Then the cavity thus formed is to be filled with hot oily medicine. This is to be retained until the headache is relieved." Cakra-datta¹ also mentions it. The bag is described to be sixteen anguli high in the Yogaratnākara². Vāgbhaṭa³ advises us to use leather of a cow or buffalo, and it is said to have been twelve anguli broad.

LEATHER BAND

In phlebotomy, a band is advised to be applied above the spot where the vein is to be punctured. This band is recommended to be made of cloth, or pute, or leather, or barks of

¹ आशिरो व्यायत चर्मं कृत्वाष्टाङ्गुलमुच्छ्रितम् ॥

तेनावेष्ट्य शिरोऽधस्तान्मापकत्वेन लिपयेत् ।

नियन्स्त्रीपविष्टस्य तैलेरुण्ये प्रपूरयेत् ॥

Cakradatta, Śīro roga Cikitsā

² आशिरो बापितचर्मं षोडशाङ्गुलमुच्छ्रितम् ।

तेनावेष्ट्य शिरोऽधस्तान्मापकत्वेन लिपयेत् ॥

Yogaratanākara, P 402

³ विधिसंस्थ निषण्णस्य पीठे जानुसमे मृदौ ।

शुद्धाक्तस्त्रिद्वेष्टस्य दिनान्ते गव्यमाह्वयम् ॥

द्वादशाङ्गुलविस्तीर्णं चर्मपट्टं शिरः समम् ।

आकर्ण्य बन्धनं स्थानं ललाटे वस्त्रं वेष्टिते ।

चैलवेष्टिकया बद्धा मापकत्वेन लिपयेत् ॥

ततो यथाव्याधिं शृतं स्नेहं कोणं निषेचयेत् ।

ऊर्ध्वं केशभूवो यावद्द्व्यङ्गुलं धारयेच्च तम् ॥

Aṣṭāṅga Hṛdaya Samhitā, I xxii

trees, or tendrils of twining plants¹, and it should not be applied either too tight or too loose. As for example, in phlebotomy in the foot, the *yanīa-sāṭaka* or ligature should be applied below the knee-joint while the band is to be tied round, at a distance of four anguli above the part selected for the operation.² *Vāgbhata*³ says "In phlebotomy, a band is to be tied round the upper extremity, four anguli above the spot selected for opening the vein which is to be made prominent by pressing it upwards with the closed fist" *Cakradatta*⁴ also quotes it. *Vāgbhata*⁵ recommends us to use a cloth band to be tied round the leg, four anguli above the spot selected for opening the vein in the leg.

This band corresponds to the band of *Antyllus* used by the Greeks. *Antyllus* applies a ligature of two fingers'

¹ गात्रं बद्धोपरि दृढं रज्ज्वा पट्टेन वा समम् ।

Astāṅga Hṛdaya Samhitā, I १२२१

वस्त्रपट्टचर्मान्तर्वल्कललतानामन्यतमेन यन्त्रयित्वा नातिगाढं नातिशिथिलं शरीरं प्रदर्शमासाद्य यथोक्तं शस्त्रं गृहीत्वा सिरां विधेत् ॥

Susruta Samhitā, III १४१

² तत्र पादव्यध्यसिरस्य पादं समेस्थाने सुस्थिरं स्थापयित्वा पादमौपतसङ्कुचितमुच्चैः कृत्वा व्यध्यपादं जानुसन्धेरधः शटकीनावध्यं हस्ताभ्यां प्रपीष्य गुल्फं व्यध्यप्रदेशस्योपरि चतुरङ्गुलम् श्लोतदीनानन्यतमेन बद्धा पादासिरां विधेत् ॥

Ibid

³ विध्येद्धस्तसिरां बाह्यावनाकुञ्चितं कूर्परे ।

बद्धा सुखोपविष्टः सुष्टिमङ्गुष्ठं गर्भिणीम् ।

ऊर्ध्वं वेध्यप्रदेशाच्च पट्टिकां चतुरङ्गुले ॥

Astāṅga Hṛdaya Samhitā, I १२२१

⁴ *Cakradatta*, *Sūtra Ratnādhikāra*

⁵ पादे तु सुस्थितेऽधस्तानानु सन्धेर्निपीडिते ।

गाढं कराभ्यामागुल्फं चरणे तस्य चोपरि ॥

द्वितीये कुञ्चिते किञ्चिदाहटे हस्तवत्तत ।

बद्धा विध्यैर् सिरामित्यमनुक्तेष्वपि कल्पयेत् ॥

Astāṅga Hṛdaya Samhitā, I १२२१

breadth round the arm in bleeding at the elbow, while to bleed at the ankle, the band is to be applied at the knee. It is mentioned as fillet in the pseudo-Hippocratic treatise on Ulcers,¹ and Oribasius² gives an interesting dissertation on the subject, principally condensed from the works of Herodotus, Antyllus and Galen. Paul³ also ties a narrow band round some muscular part of the arm before abstracting blood from the inner part of the elbow. "Wherefore we must tie a narrow band around some muscular part of the arm, and having by friction of the hands upon one another produced the necessary fulness of the vein, we divide it transversely, but only along its breadth."

LEATHER BOTTLES, JARS, MASAKA, etc

Leather was used in the manufacture of bottles and jars. Leather masaka for honey, Soma juice, and dadhi (curdled milk), is mentioned in the Rgveda⁴ and also in the Laws of Manu where

¹ Ulcers, iii 328

² Med Collect, vii, Phlebotomy

³ Paulus Aegineta Adam's Trans Bk VI Sec XL

⁴ दृतेरिव तेऽह्वमस्तु सख्य ।

अच्छिद्रस्य दधन्वत सुपूर्णस्य दधन्वत ॥

Rgveda, 6 M 48 S 4 A 8 Ch 18 v

• यो ह वा सधुनी दृतिराहितो रथचर्षणे ।

तत पिवतमग्निना ॥

Ibid, 8 M 5 S 5 A 8 Ch 19 v

उच्छिष्ट चम्बोर्भर सोम पयिव त्रा सृज ।

नि धेहि गीरधि त्वचि ॥

Ibid, 1 M 28 S 1 A 2 Ch 9 v

एष सोमो अग्नि त्वचि गवा म्रीडत्यद्रिभि ।

इन्द्र मदाय जीहुवत ॥

Ibid, 9 M 66 S 7 A 2 Ch 29 v

it is called *drti*¹ Leather masaka or inflated skins were in use as swimming bladders, and we have a representation of "figures with garlands in their hands, swimming and disporting themselves, supported on masaks or inflated skins"² In the Rgveda, Agastya in his spell to neutralise poison, says³ "I deposit the poison in the solar orb, like a leather bottle in the house of a vendor of spirits"⁴ Dr Mitra points out that "other smritis ordain that oleaginous articles preserved in leather bottles do not become impure by the contact of the impure cowhide, and in the present day, jars of that material are in extensive use in Bengal and the North-West Provinces for the storage of oil and ghee In the latter place, leather bags are universally used for raising water from wells, and

रुवति भीमो वृषभस्तविष्यया शङ्गे शिशानी हरिणी विचक्षण ।

आ योनि सोम सुकृत नि धीदति गव्ययो त्वग्भवति निर्णिगव्ययौ ॥

Rgveda, 9 M 70 S 7 A 2 Ch 7 v

एष स्य भानुरदियति युज्यते रथ. परिज्मा दिवो अस्य सानवि ।

पृचासी अस्मिन्मिथुना अधि त्रयो दृतिस्तूरीयो मधुनो वि रप्शते ॥

Ibid, 4 M 45 S 3 A 7 Ch 1 v

See Wilson's Rgveda, II 28

¹ इन्द्रियाणां तु सर्वेषां यदेकं चरतीन्द्रियम् ।

ततोऽस्य चरति प्रज्ञा दृते पादादिवोदकम् ॥

Manu Sāmhita, II 99

"But when one among all his organs fails, by that single failure his knowledge of God passes away, as water flows through one hole in a leathern bottle"

Ibid, Jones' Translation

² Pl. ११११ fig 1 Fergusson's Tree and Serpent Worship, P 127

³ सूर्यो विषमा सजानि दृति सुरावतो गृहे ।

Rgveda, 1 M, 191 S 2 A 5 Ch 10 v

⁴ Ibid Wilson's Translation

according to the law books of Śaṁkha and Likhita,¹ that water is declared pure which is kept in old leather bottles"² To this may be contrasted the prevailing Hindu notion that water is defiled if touched by a Brāhmana in his shoes. Though the leather is not allowed to be a material of dress of the Hindus except his shoes which are considered as unclean, leather belts formed one of the eight sacred utensils necessary for a sramana of the Buddhist order, and in the Manu Samhitā³ we find the students of theology advised to "wear for their mantles, the hides of black antelopes, of common deer, or of goats."⁴

5. ANTARVĀKALA THE INNER BARKS OF TREES

Barks of trees are recommended to be used as splints for the support of fractured bones. In fractures of bones of the foot, leg and thigh, Sūśruta directs us to use splints made of barks of trees⁵ to surround the limbs. In the treatment of a simple fracture, Bhūta Misra advises us to use cold water first, then mud is to be applied, and lastly the fractured bones should be secured

¹ आपो न्यवदशन्धवत्य परिग्रह जीर्णचर्मकरण्डकेवभ्युज्जता ।

चर्मकरणा चर्मपुट ।

Śaṁkha and Likhita

² Dr R C Mitra's Indo Aryans vol II

³ कार्णवीरवाम्बानि चर्माणि ब्रह्मचारिण ।

वसीरन्नानुपूर्वेण शाणचीमाविकानि च ॥

Manu Samhitā, II 41

⁴ Ibid Sn Wm Jones' Translation II 41

⁵ अभ्यज्य सर्पिषापाद तलभग्न कुशीत्तर ।

वस्त्रपट्टेन बध्नीयान्न च व्यायाममाचरेत् ॥

Sūśruta Samhitā, IV 111

by splints and bandages¹ In the Yogaratnākara², we are advised to treat fractures, by lowering the raised end and elevating the depressed end of the bone, and then by using splints and bandages to keep them in position Bhāva Miśra³ describes it similarly after Suśruta Suśruta directs us to use barks of Vata (*Ficus Indica* Rox) and bamboo strips as splints to support the neck after reducing its dislocation by holding at the temporo-maxillary articulations on the sides and the occipital protuberance on the back, and raising him up in the air He should lie down with his head raised for seven days⁴ In modern times, the Sayre's suspension apparatus and july mast serve the same purpose

The barks of Madhuka (*Bassia latifolia*), Aśvattha (*Ficus religiosa*), Kukubha (*Terminalia arjuna*), Polāśā (*Butea frondosa*, Rox), Udumbara (*Ficus glomerata*, Rox) bamboo, sāla (*Shorea robusta*), Vata (*Ficus Indica* Rox) are mentioned as

¹ आदौ भग्नं विदित्वा तु सेचयेच्छीतलागुना ।

पङ्केनालिपनङ्कार्यं वन्धनञ्च कुशान्वितम् ॥

Bhāva Prakāśa, II iii Bhagnādihikāra

² पङ्केनालिपनं कुर्याद्वन्धनं च कुशान्वितम् ।

अवनामितमुन्नाम्योदुन्नतं चावपीडयेत् ॥

चित्तं द्विधापि च स्थाने संस्थाप्य विधिमाचरेत् ॥

Yogaratanākara, P 345

³ अवनामितमुदुन्नतञ्चोदुन्नतञ्चावपीडयेत् ।

आच्छेदतिचित्तमघोगतश्चोपरि वर्त्तयेत् ॥

Suśruta Samhitā, IV iii

Bhāva Prakāśa, II iii Bhagnādihikāra

⁴ अवटावयद्वन्धोश्च प्रगृह्णीन्नमयेन्नर ।

तथा कुशान् समदत्त्वा वस्त्रपट्टेन वेष्टयेत् ।

उत्तानं शाययेच्चैनं सप्तरात्रमतन्द्रितम् ॥

Suśrutā Samhitā, IV iii

supplying the materials of splints¹ Bhāva Miśra² adds Kadamba (*Anthocephalus cadamba*), Iljjala (*Barringtonia acutangula*), Saijja (*Pinus longifolia*) to the list. Such splints are called kuśa, and Vāgbhata³ says that the splints should be broad, thin, pliant and clean.

Dr. Jacobi, of Dublin, says that he has seen an excellent splint made from the "fresh bark of a tree, taken off while the sap is rising" "It fits admirably", says he, "just like paste-board soaked in water"⁴ Dr. C. C. Jewett⁵ recommends for the same purpose the bark of leiodendron, or tulip tree.

THE CRUTCHES

The crutches were used to help the crippled. In the Vajasaṇīya Samhitā of the White Yajurveda, there is a passage describing the different kinds of human victims, appropriated to particular gods and goddesses. The passage occurs also in the Taittirīya Brāhmaṇa with slight differences. There we

¹ मधूकीदुग्धराश्रित्य पलाशः ककुभत्वचः ।

वशसर्ज्जं वटानां वा कुशार्थमुपसहरेत् ॥

Suśrūta Samhitā, IV 111

² मधूकीदुग्धराश्रित्य कदम्बः निचुलत्वचः ।

वशसर्ज्जं ज्जुनानाञ्च कुशार्थमुपसहरेत् ॥

Bhāva Prakāśa, II 111 Bhingnādhikāra

³ कदम्बोदुम्बराश्रित्यसर्ज्जं पलाशजे ।

वशीकृष्वै वा पृथुभिः स्तनुभिः सुनिवेगिते ॥

सुशर्च्छं सुप्रतिस्तम्भे वल्कले शकलेरपि ।

कुशाङ्गयेः समं वन्ध पदस्थोपरि योजयेत् ॥

Astāngga Hīdṛṇa Samhitā, VI 22111

⁴ Hamilton's Fractures and Dislocations 5th Ed. P. 50-51

⁵ The 20th Mass. vols.

find "to the two (deities) who preside over the gains above or below one's expectation (utkula and vikula), a cripple, who can not move even with the help of a crutch" is recommended to be sacrificed. And again "to the divinity of land, a cripple who moves about on a crutch" ¹

The use of the sound limb as a splint of support for the fractured bone of the opposite side was well known. Wooden splints resembling in shape the injured member are also recommended. Suśruta says ² that if the hand be fractured, it is to be tied with the opposite hand, but in fractures of both the hands, Gayadāssa ³ recommends a wooden hand to be used as a splint for both. After union of the fractured bones, the hands should be made to hold balls of cow-dung, mud and stones.

6 LATĀ OR CREEPERS (TENDRILS OF)

The tendrils of creepers as materials of ligature are mentioned

¹ उत्कुलविकुलाभ्या (उत्कुलविकुलीभ्य) विश्विन ।

भूयै पीठसर्पिनमालभते ।

Taittirīya Brāhmaṇa

Quoted in Mitra's Indo Aryans vol II P 84—85

² उमे तले समे कृत्वा तलमग्रस्य देहिन ।

वक्षीयादामतेलेन परिषेकश्च कारयेत् ।

प्राग् गोमयस्य पिण्डं धारयेन् मृण्मयं तत ।

हस्ते नातवलीचापि कुर्यात् पाषाणधारण ॥

Suśruta Samhitā, IV 111

³ गयोतु उमेऽपि हस्ततले तवेकस्य भङ्गे वाम दक्षिणेन दक्षिण वामेन, उभयोस्तुभङ्गेन तत्समेन, काष्ठस्येन कृत्वा इह अपि वक्षीयादेव दार्ढ्यं भवतीति, मृत्पिण्डादिधारणमात्मकम् प्राप्तर्यम् ।

Quoted in Dallana's Commentary, IV 111

by Suśruta. He recommends¹ to give up a patient, bit by a snake, as hopeless when he does not respond to the application of stimuli, such as cold water, tendrils of creepers, etc. Vāgbhata² advises us to introduce the stalk of the lotus, with a thread tied to it, inside the throat to extract any foreign body stuck there. When the soft stalk is touched by the śalva, it should be extracted by the sudden withdrawal of the stalk and thread.

7. VĀSIRĀ OR CLOTH

Cloth as a material of bandages, tents, gauze, etc. has been described before⁴

8. AṢṬHĪASMA ŚIṆI OR PEBBLE

It is a piece of stone—long and round. It is advised to be used for moving arrows fixed in the bone. Caraka⁶ advises us to strike two pieces of stone against each other to resuscitate a

- ¹ अजीर्णं पित्तातपं पोडिनेषु बालप्रसेहेष्वथ गर्भिणीषु ।
 वृद्धातुरं क्षीणबुद्धिनेषु रुक्षेषु भीरुष्वथ दृष्टिनेषु ॥
 शस्त्रक्षते यस्य न रक्तमस्ति रात्र्योलताभियं न सम्भवन्ति ।
 शोताभिराग्निश्च न रोमं हृषी विषाभिभूतं परिवर्जयेत् ॥

Suśruta Samhitā, V 111

- ² कण्ठस्त्रोतोगते शल्यं सूत्रं कण्ठे प्रवेशयेत् ।
 विसृजेत् ततः शल्यं विसृज्य सूत्रं समं हरेत् ॥

Aṣṭāṅga Hīdaya Samhitā, I 22111

- ³ वस्त्रं प्रसिद्धं तूलकं सूत्रनिश्चितं वैद्यनार्थं प्रयुज्यते ॥

Vāgbhatārtha Kaumudī, I 127

- ⁴ See P. 176-83

- ⁵ 'अग्नाप्रस्तररवण्ड' शस्त्रपीडनार्थं निर्घातनाश्च युज्यन्ते ॥

Ibid

- ⁶ 'अग्निना, सघट्टनं कर्णधोर्मुले शोतोदकेनोष्णोदकेन वा सुखपरिषेकः ।

Caraka Samhitā, IV 7111

still-born child In bleeding from the veins of the neck, Vāgbhata¹ advises the patient to hold firmly two pieces of stones in then hands

A piece of stone is to be used by a person, for holding it with his hand, after recovery from fractures of the carpal and metatarsal bones²

In ancient times, in India, the kings used to decorate themselves with antidotal gems, as a safeguard against poisons³ Even now the snake charmers apply a black stone on their bodies where they are wounded by the venomous reptile This stone is popularly known as the vi a-pāthara or poison-stone, and is supposed to have the property of extracting poison from the body

9 MUDGARA HAMMER

Suśruta directs us to use a hammer or a piece of stone to strike an arrow firmly fixed in the bone, until loosened, when it can be conveniently extracted by means of a pair of forceps⁴ It should be pointed out that the tubular instrument—Śalya

¹ पाषाणगर्भहस्तस्य त्रानुद्ये प्रसृते भुजे ।

कुचेरारम्य स्रद्धिते विध्येदङ्गोऽपट्टके ॥

Astīnga Hrdaya Samhitā, I xxvii

² See foot note 2 P 196

³ विषघ्नैरुदकैः स्नातो विषघ्नमणिभूषितः ।

परीक्षित समन्त्रीयाग्याङ्गुलाविघ्नपञ्चकृतः ॥

Kāmandakīya Nīṭisāra, Ch vii v 10

रचितो गङ्गागोद्वार मणिर्ग्रन्थ विभूषणः ।

स्यावर जङ्गम तस्य विष निर्व्यापिता व्रजेत् ॥

⁴ अस्थिदेशोत्तुण्डित मष्टीलागममुद्गराणामन्यतमस्य प्रहारिण विद्यान्वययामार्गमेव ।

Suśrutā Samhitā, I xxvii

nughātānī—described before¹, served the same purpose Vāgbhata also uses a hammer² to shake an arrow fixed in the bone, and directs us to extract it with the hands or by the various kinds of forceps³

The Greeks used some non instrument to shake such an arrow from the place where it was lodged The hammer was also used by the Greeks and Romans but in a different capacity Paul mentions its use in cranial surgery to strike the lenticular and gouge⁴ Paul and Celsus describe a “method of extracting foreign bodies from the ear by laying the patient on a board and striking the under side with a mallet”⁵ Vāgbhata describes this method for draining out water from the ear⁶

10 PĀNIPĀDATAḤ THE PALM OF HAND AND SOLE OF FOOT

11 ANGULI OR FINGERS

The surgeon's hand is considered by Sūśruta to be the principal instrument as the use of all other instruments depends

¹ See P 111

² सुद्धराहतया नाड्या निर्घाल्योत्तुङ्खितं हरेत् ।

तैरेव चानयेन्मार्गमार्गोत्तुङ्खितं तु यत् ॥

Aṣṭāṅga Hṛdaya Samhitā, I xxviii

³ अथाहरेत् करमाद्यं करणैवेतरत् पुन ।

दृश्यं सिंहाहिमकरवर्मिं कर्कटकाननै ॥

अदृश्यं वर्णसंस्थानाद् गृहीतुं शक्यते यत ।

कञ्च भङ्गाद्ध कुरर शरारी वायसाननै ॥

Ibid

⁴ Paulus Aegineta VII xc

⁵ Milne, Græco Roman Surgical Instruments, p 125

⁶ कर्णेऽगुं पूर्णे हस्तेन मथित्वा तैलवारिणी ।

त्रिपेदधोमुखं कर्णं हन्याद्वा चूषयेत् वा ॥

Aṣṭāṅga Hṛdaya Samhitā, I xxviii

upon it¹ But again he mentions the hand and foot as accessory to, or substitutes for, the instruments Longmore³ says "Of all instruments for making a complete examination of a gun-shot wound as well as for exploring for foreign bodies which may be lodged in it, the finger of the surgeon is the most appropriate, whenever a wound is large enough to admit of its insertion" There are many instances of the use of hand and foot in the treatment of surgical diseases but I shall point out a few of them

1 Both Suśruta³ and Cakradatta⁴ say that "if a swelling be hard but slightly painful, then it should be well fomented, pressed and rubbed by a piece of bamboo, or palm of the hand, or thumb to cause its subsidence Bhāva Miśra also quotes this verse⁵ Suśruta⁶ and Vāgbhata⁷ recommend a similar treatment for enlarged glands

¹ See foot note, P 90

² Longmore, Gun shot Injuries, 1877, P 319

³ अभ्यज्य स्वेदयित्वा तु वेणुना वा शनैः शनैः ।

विमर्दयेद्विषक् प्राञ्जन्तलेनाङ्गुष्ठकेन वा ॥

Suśruta Samhitā, IV 1

⁴ अभ्यज्य स्वेदयित्वा च वेणुनाद्यात शनैः ।

विम्लापनाय रुद्धीयात् तलेनाङ्गुष्ठकेन वा ॥

Cakradatta, Vṛnāsōthā Cikitsā

⁵ अभ्यज्य स्वेदयित्वा तु वेणुनाद्या शनैः शनैः ।

विमर्दयेद्विषङ्गमन्दन्तलेनाङ्गुष्ठकेन वा ॥

Bhāva Prakāśa, II 111

⁶ हनेषु दोषेषु यथानुपूर्व्यं यथौ मिषक् स्निग्धं समुत्थिते तु ।

सिन्नस्य विम्लापनमेव कुर्यादङ्गुष्ठलोहोपलवेणुदण्डे ॥

Suśruta Samhitā, IV 1111

⁷ सम्वेद्य बहुशोथानि विरुद्धीयात् पुनः पुनः ।

Aśtāṅga Hṛdaya Samhitā, VI 111

2 Suśruta says¹ that "when a morsel of food sticks in the throat, a blow should be fearlessly struck with the fist on the shoulder of the patient without his knowledge" Vāgbhata² also describes it

It is however curious to find that exactly the same procedure was adopted by Alsinuavius Adams in his commentary³ on Paul says that "when a morsel of food sticks to the œsophagus, Alsinuavius directs that the person should be struck on the back, which will facilitate the descent of it"

3 In the reduction of dislocation of the lower jaw, Caraka used his fingers to do it exactly in the same way as recommended by the modern surgeons He directs us to depress the lower jaw by the thumbs and at the same time to raise the chin by the index fingers⁴ The verses are quoted by Cakradatta⁵ The description of the method, quoted from any modern text book, would be a good commentary on the above passage of Caraka Enichen says⁶ "The reduction is best effected, by the surgeon,

¹ यासुगन्वेत् कण्ठामर्तं निशदमनबुद्धिस्तथै सुष्टिनाभिहत्यात् स्नेहं मय पानीयम् वा प्रापयेत् ।

Suśruta Samhitā, I ५५५

- अस्थानं क्लृप्ताघाताभ्यां यासुगन्वेत् प्रवेगयेत् ।

Astānga Hṛdaya Samhitā, I ५५५

² Adam's Commentary on Paulus Ægineta, VI ५५५

³ व्याख्यानं हनु खिनमङ्गुष्ठाभ्यां प्रपीड्य च ।

प्रदंशनीभ्याञ्चोन्नम्य चिचुकोन्नमनं हित ॥

संस्थां सङ्गमयेत् स्थानं संस्थां स्विन्नं विनामयेत् ।

प्रत्येकं स्थानद्वयादिक्रियां वैशेष्यमाचरेत् ॥

Caraka Samhitā, VI ५५५

⁴ Cakradatta, Vāṭabhyādhi Cikitsā

⁵ Surgery, Vol II, p 658

standing before the patient, placing his thumbs, well protected by napkins, or a few turns of a narrow bandage, on the molar teeth on each side, and then depressing the angles of the jaw forcibly, at the same time that he raises the chin by means of his fingers spread out and placed underneath it”

4 Caraka says¹ “After pairing her nails and covering the tip of her index finger with cotton, the nurse is to clean the palate, lips and throat of the new-born child”

With this passage we may compare what Barnes says on the point² “The attendant having then placed the child close to the mother, so as to avoid any strain on the cord, should cleanse its mouth from any fluids, such as blood and mucus, it may have partially swallowed during its passage through the vagina. This should be done at once, as such fluids drawn into the lung vesicles may give rise to inflammation of the lungs, or even septicæmia”

5 Āsūruta³ recognises “six modes of diagnosing diseases, namely by the five senses *i.e.* by hearing, smell, taste, sight and touch, and by questions. “Symptoms discernible by the sense of touch are coolness or heat, smoothness or roughness, softness or hardness, and other tangible qualities of the skin in fever, dropsy,

¹ अथास्य तालोष्ठकण्ठ जिह्वाप्रमार्ज्जनमारभेत अङ्गुल्यासुपरिलिखितनखया सुप्रक्षालितो-
पधानकार्पासपिचुमत्या प्रथमं प्रमार्ज्जितस्यास्य च शिरस्तालु कार्पासपिचुना चेद्गर्भेन प्रति-
ष्ठादयेत् ।

Caraka Samhitā, IV viii

² Obstetric Medicine and Surgery, Vol II, p 105

³ षड्विधो हि रोगाणां विज्ञानोपायः । तद्यथा पञ्चमि श्रोत्रादिभिः प्रश्नेन चेति ।

* * * * स्पर्शनेन्द्रियविज्ञेया शीतोष्णदृक् कर्कशमृदुकठिनत्वादयो ज्वरशोफादिषु ।

Sūśruta Samhitā I x

and other diseases” And we know how important it is to educate the tactile sense in the diagnosis of diseases

6 The foot is recommended to fix a part of the human body whence any foreign body may be removed easily by the hands ¹ Suśruta says² “If a foreign body cannot be easily extracted, as when it is impacted in the hollow or the substance of a bone, the part should be pressed by the feet, and it should be drawn out by the instrument” Vāgbhata also gives a similar description³ Caraka describes a method of removal of the placenta if not spontaneously separated One of the female attendants should press upon the navel of the puerpera forcibly with her right hand, while with the left hand placed upon her back, she should shake her Then the heel is to be placed on the patient's buttock while the two sides of the gluteal regions are also to be pressed and shaken⁴

12 JIHVĀ OR TONGUE

The organ of taste as a means of diagnosis is noted by

¹ पाद इति पादेन शरीरदेशे धृत्वा हस्तादियन्त्रेण उद्धरणं क्रियते ।

Vāgbhatāṭha Kaumudī, I xxv

² अस्थिविवरप्रविष्टं अस्थिविदष्टं वाऽवगृह्य पादाभ्या यन्त्रेणापहरेत ।

Suśruta Samhitā, I xxvii

³ अस्थिदृष्टे नर पदभ्या पौडयित्वा विनिर्हरेत् ।

इत्यशक्ने सुवलिभि सुगृहीतस्य किञ्चरे ॥

Astānga Hrdaya Samhitā, I. xxviii

⁴ तस्याश्च दमरा न प्रपन्ना स्यादधैनामन्यतमा स्त्री दक्षिणेन पाणिना नाभेरुपरिष्ठाहलवत निपीड्य सव्येन पाणिना पृष्ठत उपसंगृह्य सुनिर्जितं निर्जनुयात् । अथास्याः पादपार्श्वयोः शोषीमाकोटयेदस्या स्निचावुपसंगृह्य सुपीडितं पौडयेत् ।

Caraka Samhitā, V. .

Suśruta¹ "Symptoms discernible by the sense of taste are the various tastes noticeable in morbid secretions of urine and other diseases" Cakrapāṇi "explains that 'inference' is necessary, because the sense of taste can not be exercised by the physician on the patient directly,"² he must do it through some intermediate agents such as ants, whose attraction to sugar is well-known and so the presence of sugar in urinary diseases can be inferred "

13 DANTA OR TOOTH

Ivory as a material of surgical instruments has been described before³ Suśruta⁴ advises us to use the ash of ivory with stibium as a stimulant to the growth of hair on a scar. It is also recommended by Vāgbhata⁵

14 NAKHA OR NAILS

Suśruta advises the surgeon to use his nails⁶ for the operation of cutting, piercing and extraction, if these can be possibly helped by his nails

In modern times, nails often help the surgeons in separating

¹ रसनेन्द्रविज्ञेया ग्रन्थेहादिषु रसविशेषा ।

Astāṅga Hrdaya Samhitā, I \

² Hœrle's Commentary on the Susruta Samhitā, I \ (Bibliotheca Indica)

³ See page 67

⁴ हस्तीदन्तमसो कृवा मुष्यञ्चैव रसाञ्जन ।

रोसाद्येनेन वायन्ते लिप्ताः णनितलेष्वपि ॥

Suśruta Samhitā, IV 1

⁵ तैलाक्ता हस्तिदन्तस्य मयी वा चीपध परम् ॥

Astāṅga Hrdaya Samhitā, VI ५५४

⁶ आहार्यच्छेद्यभेदेषु नखे शक्येषु योजयेत् ।

Suśruta Samhitā, I viii

layers of tissues during operation as in the operation for the radical cure of hydrocele. We often extract thorns, impacted in our body, with our nails.

15 MUKHA OR MOUTH

The use of mouth as a suction apparatus was well known to the ancients. Suśruta advises us to use *mā* or *pānimantha* (awl) to perforate bone in diseases of the medullary canal, caused by obstructed and deranged air. He next introduces one end of a tube, open at both ends, into the canal through the perforation in the bone, while through the other end the surgeon sucks out air by his mouth¹. The use of mouth for sucking out air through the *śunga* or horn has been described before². Caraka says³ that the poison of a snake-bite may be sucked out by the surgeon's mouth, filled with flour or ash. Even in modern times, it is common amongst Indians to suck out blood, in accidental cuts by knives, by the mouth. The practice of the suckers in Europe has been noted before⁴.

16 VĀLA OR HAIR

Horse-hair is to be used for applying ligatures round the piles⁵. It is also a material of suture for the skin. Horse-hair is also described to have been used for raising pterygium. Paul⁶ also used horse-hair to raise a pterygium.

¹ निरुद्धेऽस्थनि वा वागी पाणिमन्थेन दारिते ।

नाडी दध्वास्थनि निपक् चूपयेत् पवन बली ॥

Suśruta Samhitā, IV 17

² See P 148 49

³ दश वा चूपेन्मुखेन यवचूर्णपाशयूर्णेन ।

Caraka Samhitā, VI 117

⁴ See P 149 50

⁵ बाला, अद्यादीना प्रच्छन्नविकेशा वृक्षेण्य अर्णो वात्यादि वन्धनार्थं युज्यते ।

Vāgbhatārtha Kṛmudī, I 117

⁶ Paulus Ægineta, VI 111

Suśruta¹ says "Bundles of hairs or tents are to be used in the treatment of wounds in the skull, formed by the extraction of an arrow from the brain. These would prevent the hernial protrusion of the cerebral substances from passing out through the wound. The hairs are to be removed one by one, as the wound heals up gradually." Vāgbhata² also approves this treatment.

A bundle of hairs tied to a long thread is mentioned by Suśruta to have been used for the extraction of fish-bones from the throat³. The patient is directed to swallow the ball of hairs with some liquid. Next emetics are to be administered to excite vomiting. During this act, the foreign body gets entangled in the meshes of the ball, which being then suddenly pulled out by the thread outside, extracts the fish-bone satisfactorily. Vāgbhata⁴ also describes it similarly. For this purpose

¹ शिरसोऽपद्धते शल्ये बालवर्त्ति प्रवेशयेत् ।

बालवर्त्त्यामदक्षया मस्तुलङ्ग व्रणात् सवेत् ॥

Suśruta Samhitā, IV 11

² कार्यं शल्याद्वते विद्धे भङ्गादिदन्ति क्रिया ।

शिरसोऽपद्धते शल्ये बालवर्त्ति प्रवेशयेत् ॥

मस्तुलङ्गसुते क्रुद्धो हन्यादेन चलोऽन्यथा ।

व्रणे रोहति चैकैक शनैरपनयेत् कचम् ।

मस्तुलङ्गसुतौ खादेन्मस्तिष्कानन्यजीवजान् ॥

Aṣṭāṅga Hṛdaya Samhitā, VI xxvi

³ अस्थिशल्यमन्यद्वा तिर्यक्कण्ठासक्तमवेच्य केशोष्णक दृढैक सूचवद्द्रवभक्तोपहितं पययेदाकण्ठाच्च पूर्णकोष्ठ वामयेद्धमतश्च शल्यैकदेशसक्तं ज्ञात्वा सूच सहसा त्वाचिपेत् ।

Suśruta Samhitā, I xxvii

⁴ कोशोन्दुकेन पीतेन द्रवे कण्टकमाचिपेत् ।

सहसा सूचवहेन वमत सेन चैतरत् ॥

Aṣṭāṅga Hṛdaya Samhitā, I xxviii

a tooth brush formed by chewing the end of a narrow branch of a tree is also recommended¹ A common domestic remedy is to make the patients swallow large morsels of boiled rice, plantain, etc

Paul² mentions a similar contrivance, and says "Some are of opinion that the patient ought to be made to swallow large morsels, such as stalk of lettuces or pieces of bread, but others direct us to bind a thread about a small piece of clean soft sponge and give it to the patient to swallow, and then taking hold of the thread to draw it up, and to do this frequently in order that the thorn may get fixed in the sponge and be brought up" For this purpose Aetius used the epilation forceps Paul calls it *acanthobolus* or the fish-bone forceps

The modern surgeons use a probang for the same object "Small sharp bodies, such as bistles, fish-bones, or pins, are generally found sticking between the pillars of the fauces and the tonsils" Such bodies "should not be pushed on, but an endeavour should be made to catch them with the "horse-hair probang" This being pushed gently, unexpanded, beyond the point where the pin or bone is stuck, is expanded by pulling up the handle and then withdrawn with a slight rotatory motion"³

Caraka⁴ mentions the practice amongst the recently delivered

¹ मृदुना वा दन्तधावनकुर्वन्केनापहरित ।

Suśruta Samhitā, I xxvii

² Paulus Aegineta, VI 1xxi

³ Swain's *Surgical Emergencies*, 3rd ed, Pp 32 33

⁴ अथास्या बालवेष्ट्या कण्ठतालु परिमृशेत् ।

Caraka Samhitā, IV xviii

women to push a braid of her hair into her throat, to help the expulsion of the placenta. So in the *Yogarātnākara*¹, her throat is advised to be rubbed by a finger surrounded by hairs. This practice is still prevalent among the women of Bengal to a certain extent.

SUTURE MATERIAL

Horse-hair was the material used by the Hindus for sutures. Besides it, they used² sutures of fine thread, or the fibres of the bark of *Aśmantaka* (*Cæsalpina digynia*), or threads made of hemp or flax, or of the fibres of which bow-strings were made, or of the fibres of the *Mūrvā* (*Sansevieria zeylanica*) or *Guḍūcī* (*Tinospora cordifolia*). Besides these, the Hindu surgeons used the mouth parts of the ants as clasps to close incisions on the intestines. *Suśruta*³ describes the use of living black ants to close the incisions on the walls of the intestines, during the operation for intestinal obstruction, after removing the scybala, stones, etc. He advises us to remove the bodies of the ants, leaving their heads fixed on the margins of the incision,

¹ केशवेष्टित्याङ्गुला तस्या कण्ठं प्रवर्षयेत् ।

Yogarātnākara, P 437

² सीव्येत सूक्ष्मोऽथ सूत्रेण वल्केनाश्रमन्तकस्य वा ।

सनजजीमसूवाभ्यां स्नाप्यां बालिनं वा पुनः ॥

सूर्वाङ्गुलीतानैर्वा ।

Suśruta Samhitā, I ११४

स्नाप्यां सूत्रेण वल्केले ।

सीव्येन्न दूरे नासन्ने गृहान्नात्यन्तं वा बहु ॥

Aṣṭāṅga Hṛdaya Samhitā, I २१४

³ परिस्त्राविश्याप्येवमेव शल्यमुद्धृत्यान्तस्त्रावान् सशोध्य तच्छिद्रमन्तं समाधाय कृण्वन् पिपीलिकाभिर्दृश्येत् दष्टे च तासां कायानपहरेन्न सिरासि ततः पूर्व्ववत् सीव्येत ।

Suśruta Samhitā, IV २१४

in the act of biting. Then the intestines should be replaced with the ants' heads sticking to them. Caraka¹ also describes the use of ants for obliteration of small perforations in the intestines, but he takes away the ants before replacing the gut into the abdominal cavity. If by any accident, the abdominal muscles be incised and the intestines come out of a gaping wound, Susruta recommends us to allow black ants to bite the exposed coils of intestines before replacing them into the abdomen². This is a curious practice of ancient surgery of the Hindus. The Greeks and Arabs never mentioned it. "Amongst some Indian tribes it is customary to allow both edges of a wound to be seized by the sharp head-nippers of certain ants, whose bodies are then rapidly cut off—one ant after another being used, the wound is closed."³

Susruta describes four sorts of sutures, viz

- 1 Vellitika or winding
- 2 Gophaṅkā or like a sling
- 3 Tunnī sevānī or continued sutures
- 4 Rujugraṇthi or interrupted sutures

¹ विट्पाण्यन्तस्य तु म्यूढं दशयित्वा पिपीलिकी ।

यद्गुणं सृष्टरीतानि सत्वा च्छित्त्वा पिपीलिकान् ।

प्रतियोगः प्रवेष्ट्यान्तं वरिं सीव्येद् व्रणं ततः ॥

Caraka Samhitā, VI xviii

² अभिघ्नमन्तं निष्क्रान्तं प्रवेष्टव्यं नाम्यथा भवेत् ।

पिपीलिकाशिशोयस्म तदाम्येक्षी वदन्ति तु ॥

प्रक्षाल्य पयसा दिग्धं दृणशीणितं पाशुभिः ।

प्रवेष्टयेत् कृत्तनखी घृतेनाक्तं शनैः शनैः ॥

Susruta Samhitā, IV iii.

³ Neuburger's History of Medicine Playfair's Translation, Vol I., P 9

These are advised to be so applied as they may suit the different parts of the body¹. The needles must not be introduced either too far from, or too close to the edges of the wound. In the former case, the lips of the wound shall be inflamed and so cause pain, while in the latter, the sutures will give way”

The use of horse-hair as a material for suturing wounds was unknown to the Greeks and Romans. They used sutures of flax and woollen threads for wounds. Paul says “Afterwards we unite the separated parts with a needle containing a woollen thread, being satisfied with two sutures”². Celsus³ advises us to use sutures of soft thread, and the apollinose of Hippocrates⁴ is directed to be made of crude flax.

17 AŚVAKATAKA THE RING OF A HORSE’S BRIDLE

Suśruta says that when the arrow is firmly fixed in the bone and if it can not be extracted by forcible pulling by hands or instruments, it should be tied to the ring of a horse’s bridle. Then the animal is to be whipped, when by the sudden movement of the horse, the weapon would be jerked out of the wound⁵.

18 ŚĀKHĀ OR BRANCH OF A TREE

Another method is to tie such an arrow by means of a rope

1

सीव्येहेल्लितक शनै ।

सीव्येद्वोफणिका वापि सीव्येद्वा तुद्गुमेवनी ।

ऋजुयन्त्रिसद्यो वापि यथायोगमद्यापि वा ॥

Susruta Samhitā, I xxv

¹ Paulus Ægineta, VI xii Adam’s Translations

² Celsus, V xxxi

³ Hippocrates, iii 132.

⁵ अश्ववक्त्रकटके वा वस्त्रीयादधैन कथया ताडयेद्यशोन्नमयन् शिरोवेगेन शल्यमुद्धरति ।

Suśruta Samhitā, I xxvii

to the branch of a tree, lowered by pressure¹. When the pressure is relaxed the branch suddenly goes high up, and thereby it pulls the weapon out of the wound. Dillman, however, mentions as the view that a handle-ring and a branch of a tree are to be required for the extraction of foreign bodies². Harle remarks—'The branch apparently is put through the ring to effect the extraction'³. Valbharva also mentions these contrivances.

19. ŚTHAVIRO OR ŚTHITHI

Dillman made out of it—'throwing out expectoration and spitting by the mouth'. By this means any foreign body lodged in the oral cavity, such as in the gums, fauces, may easily be ejected out.

¹ इति वा हस्तस्य कर्मणा हाता पृथक्पृथक्कृतम् ।

Sarvata Samhitā, I xxvii

— १० इत्यस्य चतुर्णां विविक्तायां भावायां मन्त्राणाम् एतं वदन्, सरसा हाताः तेषां स्तिष्ठन्ति—मन्त्राणां चतुर्णां ।

Val, bhadartha Kaumudī, I xxv

अनं तेषां स्तिष्ठन्ति चतुर्णां वा शब्दाणि सुप्रसिद्धितान्य यन्तं चैनं शारयित्वा मन्त्र-
भावाः स्तिष्ठन्ति—१० इत्यस्य चतुर्णां भावायां मन्त्राणां एतं वदन्, सरसा हाताः तेषां
स्तिष्ठन्ति—मन्त्राणां चतुर्णां ।

Nivandha Samgraha, I xxvii

* The *Sarvata Samhitā*, *Bibliotheca Indica*, P. 45 foot note 109

² तद्योज्यं वाक् वक्ष्यते धनुर्ज्या ।

सुप्रसिद्धितान्य यन्तं चैनं शारयित्वा मन्त्र-

भावाः स्तिष्ठन्ति—१० इत्यस्य चतुर्णां भावायां मन्त्राणां एतं वदन्, सरसा हाताः तेषां

स्तिष्ठन्ति—मन्त्राणां चतुर्णां ।

अनं तेषां स्तिष्ठन्ति चतुर्णां वा शब्दाणि सुप्रसिद्धितान्य यन्तं चैनं शारयित्वा मन्त्र-

Astihga Hrdaya Samhitā, I xxviii

* हीवणं येमादिनिस्सनम् ।

Nivandha Samgraha, I viii

20. PROVĀHANA OR FLUXING THE PATIENT

This comprises the acts of emesis, purgation and lacrymal secretion. Thus the foreign bodies lodged in the alimentary canal or eyes may be got rid of by causing discharges from the bowels, the stomach, or the eyes¹

21. HARSA OR OBJECTS EXCITING HAPPINESS

Persons suffering from vrana or wound are directed to have their minds in a state of cheerfulness by the sight of objects exciting happiness². A cheerful man is a better subject for a surgical operation than a morose and gloomy one. Vāgbhata³ adds fear as an accessory instrument. Joy and fear cause a sudden change in the temper of a man and so may be of some help in curing diseases⁴. Suśruta regards, sorrow as a śalya or foreign body which is to be removed by joy⁵

22. AYASKĀNTA OR LOAD-STONE

Magnet was known to the ancient Hindus⁶ and they used it

¹ तवाशुचवधूद्वार कास मूत्र पूरीषानिलै स्वभाववलप्रवृत्तै नयनादिभ्य पतति ।

Suśruta Sāmhita, I xxvii.

² सुहृदो विचिपन्त्याश्च कथाभिर्ब्रणवेदना ।

आश्वासयन्तो बहुशस्त्रनुकूला प्रियम्वदा ॥

* * * *

सम्पदाद्यनुकूलाभि कथाभि प्रीतिनानसः ।

आशवान् व्याधिमोक्षाय चिप्रं सुखमवाप्नुयात् ॥

Suśruta Samhitā, I xix

³ See foot note 1, P 98

⁴ भय हर्षौ शरीरस्य सहसा भावान्तरमुत्पादयन्तौ यन्त्रकार्यं कुरुत इति ।

Vāgbhatārtha Kaumudī, I xxv

⁵ हृदयवस्थित मनेक कारणीतृपन्न शोकशल्यं हर्षणेति ।

Suśruta Samhitā, I xxvii

⁶ मणिगमन सूक्ष्मिर्षणमदृष्टकारणक ।

Vaiśeṣikā Darśanam, Ch V Āhnikā 15

to extract minute foreign bodies such as non particles from the eyes and teeth Suśruta¹ also mentions its use for extracting an arrow from the wound, if it be without barbs

In modern times, a magnet is still used for removing a particle of iron from the eye "Indeed, cases have occurred in which the application of an inch bar-magnet connected with four Grove's cells to the outside of the cornea has caused the foreign body to retrace its course and emerge through the wound"² A fragment of iron lying in the vitreous has been removed by the Snell's electro-magnet introduced through the scleral wound behind the ciliary region "The following plan of ascertaining whether a portion of needle be really impacted has been suggested by Marshall, and successfully carried into practice by Littlewood of Leeds A powerful magnet is to be held upon the part for a quarter of an hour, so as to magnetise the fragment, a firmly hung polarised needle should then be suspended over it, when, if any iron is present, deflection will ensue"³

23. KṢĀRA CAUSTICS OR POTENTIAL CAUTERY

Caustics were highly extolled by the ancient surgeons as the external applications are better tolerated by the weak and

| | | | | | |
|---------------------|-------------|----------|-------------------|-----|------------------|
| सूक्ष्मिर्नर्पणमिति | सूक्ष्मपदेन | सौहृमात् | दृष्टञ्चोपलक्षयति | तथा | चायस्कान्तामिसुख |
| यत् सूच्यादेर्गमन | * | * | * | * | * |

Sankara Miśra, Upaskāra

¹ अनुस्रोममनववहकार्गमनस्य ब्रणसुखमयस्कान्तेन ।

Suśruta Samhitā, I xxvii

² Carter's Ophthalmic Surgery, 2nd ed., P 369

³ Erichsen's Surgery, Vol I, P 343

timid persons who are afraid of the surgeon's knife¹, though Suśruta² distinctly states "The following persons should not be treated with caustics weak people, children, old and timid people, etc." They even give them preference to the knife for they argue that surgical diseases are radically cured by the application of the caustics, without any possibility of recurrence. Suśruta says³ "Of all cutting instruments and their substitutes, caustics (or vegetable alkalis) are the most important, because by means of them deep and superficial incisions and scarifications may be made, derangements of the three humours may be rectified and some diseases can be treated with special advantage"⁴

For the preparation and uses of caustics, see the Suśruta Samhitā, I ११

For the application of potential cauteries, three classes of instruments are recommended⁵

1. *Daivī*—it is to be made of wood and should resemble a spoon in appearance

¹ अल्पसत्वेऽवली वाली पाके चातर्था मुहुते ।

दारण मर्म सन्यादिस्थिते चान्यत्र पाटन ॥

Aṣṭāṅga Hṛdaya Samhitā, I १११

² अथनेने चारकृत्या । तदथा दुर्बलवाल स्थविर भौरसर्वाङ्ग शूरोदरि रक्तपित्त-
गर्भिन्युत्तुसती प्रवदज्वरि प्रमेहीर चतचीनदृष्टा सूक्ष्मपद्गतक्षीयापठचोदृत्त फलयोनय ॥

Suśruta Samhitā, I ११

³ शस्त्रानुशस्त्रेभ्य चार प्रधानतमच्छेद्यभेदलेख्य करणाविदोषप्लवादिशेषक्रियावचारणाञ्च ।

Suśruta Samhitā, I ११

⁴ *Ibid* Hoernle's *Trans Bibliotheca Indica*

⁵ आस्त्राय च दर्बोक्ष्ण शलाकानामन्यतमेन चार पातयेत् ।

Suśruta Samhitā, IV ११.

25 AGNI ACTUAL CAUTERY

Suśruta says¹ "With regard to surgical treatment, actual cautery is said to be superior to caustics, in as much as diseases treated with the actual cautery do not re-appear, and because it can cure diseases which are incurable by medicines instruments, and caustics"² This partiality for cauteries is one of the reasons of the gradual decadence of Hindu surgery and its total extinction in the present time To this belief of the Hindus may be compared the following aphorism of Hippocrates³ —

"Those diseases which medicine do not cure, the knife cures, those which men can not cure, fire cures, and those which fire can not cure, are to be reckoned wholly incurable"

For the application of the actual cautery the following articles are considered necessary⁴ —

1 Pippali or pipea longum

2 Goat's dung

3 Teeth of a cow

4 Śara or saccharum sativa

5 Probes or śalākā (see before⁵)

} These are to be used for
diseases of the skin

o

¹ चारादग्निर्गरीयान् क्रियासु व्याख्यातस्तद्ग्वाना रोगानामपुर्णभावाद्दिषजश्चरिरसाध्याना ततसाध्यलाञ्छ ।

Suśruta Samhitā, I xii.

² Ibid Hoenle's Trans Biblio Ind

³ The Works of Hippocrates Syd Soc, vol II, p 774.

⁴ अथेमानि दहनोपकरणानि । तद्यथा पिप्पल्यजाशक्लहोदन्त शरशलाका जाम्बवीहेतर लोह्वा चौद्रगुडस्नेहाय । तत्र पिप्पल्यजाशक्लहोदन्त शरशलाकास्त्वग्गताना । जाम्बवीहेतर लोह्वानि मांसगताना चौद्रगुडस्नेहा सिरस्त्रायु सम्यस्थितगताना ।

Suśruta Samhitā, I xii.

⁵ See P. 159-60.

| | | |
|---------------------------|---|--|
| 6 Jāmvaustha ¹ | } | Used for diseases of the muscles |
| 7 Different kinds of non | | |
| 8 Honey ² | } | Used for diseases of the vessels, joints and ligaments |
| 9 Tereole | | |
| 10 Ghee | | |
| 11 Oil | | |

“Both Aetius and Oribasius represent goat’s dung, pounded with vinegar, as being equally efficacious as the sinapism, and applying particularly to ischiatic diseases”³ Hippocrates says that cauterisation may be performed with boxwood spindles dipped in boiling oil⁴ In Kordofan, are used “*El lamaia* primitive instruments used for cauterisation consisting of a piece of camel’s or sheep’s dung dried and impaled on a long thorn”⁵

12 Caution knife—This is to be used in the treatment of prolapse of the omentum in cases of abdominal injuries The

¹ अर्गो भगन्दरयन्विनाडीदृष्टव्रणादिषु ।

मासदाहो मधुखेह नास्ववीष्ट गुडादिभि ॥

Aṣṭāṅga Hṛdaya Samhitā, I xxx

² मधुक्लिष्टेन तैलेन मज्जीचीद्रवसाद्यते ।

तस्मैर्वा विविधैर्लोहैर्दृष्टेद्वाह विशेषवित् ॥

Caraka Samhitā, VI xiii

³ Adams’ Commentary on Paul vol iii bk vii sec xix

⁴ Hippocrates, ii 482

⁵ Medical Practices in Kordofan, Third Report. Wellcome Research Laboratory, Khartoum

prolapsed part is to be ligatured well and the cautery knife used to remove the prolapse below the ligature¹

Cautery knife was also known to the Greeks and Romans Galen², speaking of cancer, says that "some use heated razor blades, at once cutting and burning" Paul³ also mentions a sword shaped cautery in the radical cure of hydrocele

13 Plates of copper, lead or iron —In the application of both kinds of cauteries, plates of these metals are to be used to surround a tumour to prevent injury to the adjacent structures (Suśruta)⁴

Hippocrates⁵ in the treatment of nasal polypus, says that "when that occurs we must insert a tube and cauterise with three or four irons" Celsus⁶ says that this tube may be a calamus or a tube of pottery

14 Cakradatta mentions a probe of gold for applying actual cautery to the hair follicles after the removal of the eyelashes, to prevent a recurrence of trichiasis⁷

Albucasis similarly recommends burning the roots of hairs

¹ उदरान्नेदसो वृत्तिं निगता यस्य देहिन् ।

कषायभक्ष्यत्कौर्णं बद्धा स्वेण स्रवित् ।

अग्निवत्तेन शस्त्रेणच्छिन्द्यान्धुसमायुत ॥

Suśruta Samhitā, IV 11

² Galen, xiv 786

³ Paul, vi lxx

⁴ यदल्पमूलं वपुतामसीसं पट्टे समाविष्टं तदायसेव्या ।

चाराग्निशस्त्राण्यसृजद्विदध्यात् प्राणानहिसन् भिषग्प्रमत्त ॥

Suśruta Samhitā, IV xiii

⁵ Hippocrates, ii 244

⁶ Celsus, vii x

⁷ See foot note 2, p 66

in trichiasis with a probe of gold Paul¹ applies a heated olivary probe or an aural probe for the same purpose. Haly Abbas and Rhazes also describe this operation.

26 BHISAJA OR MEDICINES

This means such medicines as become necessary in the treatment of surgical diseases and do the work of surgical instruments to a certain extent. Suśruta gives a list of medicines,² required in the treatment of various kinds of inflammations, and I quote a few passages from the English translation³ to illustrate the action of medicines in surgical practice. "Warm poultices made of the following drugs promote suppuration, namely, fruits of *sana* (*Crotalaria juncea*), *Mūlaka* (*Raphanus sativus*), *Śīgru* (*Moringa pterygosperma*), sesamum and mustard seeds, flour of barley and wheat, *kīva* (the drugs used as a ferment in distilling spirits) and linseed. The following medicines are applied for opening abscesses, namely, *chīrañña* (*Pongamia glabra*), *agnika* (*Semecarpus anacardium*), *chitraka* (*Plumbago Zeylanica*), *danti* (*Balioperium montanum*), *hayamāraka* (*Nerium odoratum*), and the excrement of the pigeon, vulture and heron. Caustic alkalies are also very effectual in opening abscesses. Demulcent articles, such as, flour of barley, wheat or *māsha* (pulse of *Phaseolus Ruri*) promote discharge from the interior of abscesses. * * * * Pastils for fumigating ulcers should be made of *sīśeṣhatka* gum of (*Boswellia Thurifera*), *sarjaraśa* (resin of *Shorea robusta*), *śarala* (*Pinus longifolia*), and *devadāru* (*Cedrus*

¹ Paul VIII, VIII.

² See Suśruta Saṁhitā, I, 1111.

³ Dr. U. C. Dutt's Translation, Bibliotheca Indica, P. 151-154.

deodara), decoctions or cold infusions of astringent and ununitating barks should be used as washes for promoting granulations in ulcer. Tents for promoting granulations should be made of *soma* (*Sarcostemma brevistigma*), *amrita* (*Cocculus cordifolius*), *āsvagandhā* (*Withania somnifera*), the plants included under the class of *kākolyūdi*, and the buds of (*Ficus Bengalensis*)”

In treating inflammation, the Hindu surgeons used pastes to give relief to the pain and tension, warm poultices to promote suppuration, medicinal applications and incisions by knife for opening abscesses, demulcent articles to promote discharges; decoctions of drugs as corrective washes, tents of drugs and lints for introducing them into the cavities of the abscesses; decoctions in oils and clarified butter to improve the character of ulcers, pastils for fumigating sores, tents, pastes, powders and lotions for promoting granulations, drugs to repress high granulations, drainage to prevent infection, and bandages to give the part rest. This shows that the Hindus were not wholly ignorant of the antiseptic methods of treating wounds, and Suśruta enjoins that a certain incense should be kept burning in the operation room.

Of the additions to the list of Suśruta by Vāgbhaṭa, we need consider the goat's gut only.

GOAT'S GUT

The intestines of the goats, etc. are to be dried and prepared as materials of ligature¹. They should be used in ligaturing fine vessels after incision by knife, evidently to check hæmorrhage.

¹ See foot note 1 P 223

The use of goat's gut in surgery is generally considered to have been unknown to the Greeks and Romans, as it is not mentioned in their works. But Adams points out¹ "that the strings of ancient harp were made of the guts of a sheep," and thus he clearly proves from a passage in the *Odyssey* of Homer

Hippocrates² used apohnose made of crude flax, which is also mentioned by Paul for the delegation of arteries Rhases however describes the use of strings of harp³ as a material for suture in the operation called gastriaphé

ARREST OF HÆMORRHAGE

It is generally believed and often stated in modern works on surgery that the ancients were unacquainted with the proper treatment of hæmorrhage. Suśruta however enumerates four different ways of arresting hæmorrhage after venesection, namely—

- 1 Sandhāna —Contraction of the wound by astringent decoctions of Chebulic Myrobolan and the root-barks of the panchavalkala trees (five barks)
- 2 Skandana —or thickening of the blood by the application of severe cold
- 3 Pāchana —or desiccating or drying up the wound, by ashes
- 4 Dahana —or cauterising the veins to make them shrink⁴

¹ See Commentary on Paul, VI līl, vol II, P 345 Syd Soc Ed

² Hippocrates, in 132

³ Rhases Cont xviii

⁴ चतुर्विधं यदेतद्धि रुधिरस्य निवारणं ।

सन्धानं स्कन्दनञ्चैव पाचनं दहनं तथा ।

If the blood does not thicken by the application of cold, astringents should be applied, if these fail ashes should be used. By means of these three modes, the physician should endeavour to the best of his abilities to stop the bleeding, but if success be not still obtained, cautery may be resorted to as the absolute effective means¹. To stop bleeding from an artery, he advises us to apply astringents and pressure with the fingers. Vāgbhata² also describes these methods of arresting hæmorrhage, and advises us that if the ordinary means do not check the bleeding, the vessel must be again opened at a point in its course beyond the bleeding area, or actual cautery applied. Cakradatta also repeats these directions³.

Vāgbhata however mentions the sheep's gut amongst the accessory instruments. His commentator explains its use for

व्रण कषाय सन्धत्ते रक्तं क्लृप्तये हिम ।

तथा सम्पाचयेद्दण्ड दाहं सञ्जीवयेत् सिरा ॥

Suśruta Saṃhitā, I xiv

¹ अक्लृप्तमाने रुचिरे सन्धानानि प्रयोजयेत् ।

सन्धाने मश्यामाने तु पाचने समुपचारेत् ॥

कल्पोरेनैस्त्रिभिर्वेद्यं प्रयतेत यथाविधि ।

असिद्धिमत्सु चैतेषु दाहं परमं दृश्यते ॥

Ibid

² रक्तं त्वतिष्ठति क्षिप्रं सान्धनीमाचरेत् क्रियान् ।

लोमं प्रियङ्गु पक्ष्म माषयष्ट्याञ्च गोरिकै ॥

मृतकपालाघ्ननचीमं मषीं क्षीरीत्वगङ्गुले ।

विचूर्णयेद् व्रणमुखं पद्मकादि हिमं पिवेत् ॥

सामेव वा शिरा विध्येद्दण्डात् तस्मादनन्तरं ।

शिरामुखं वा त्वरितं दहेत् सप्तगलाक्षया ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I xxxii

³ See Cakradatta, *Sirāvyūdhādihikāra*

ligaturing blood-vessels¹. Suśruta says that if in venesection, or in treating wounds, excessive bleeding occurs, it should be stopped by proper means².

Celsus³ advises us to fill up the wound with dry pledgets, then to apply a sponge squeezed out of cold water and to press with the hand. If not successful, cut the vessel asunder between two ligatures, or apply cautery, or try the method of revulsion. Galen⁴ applies pressure by finger on the wounded vessel, or twists it moderately. If the vessel be an artery, he gives the alternative of a ligature or cutting across. Paul⁵ mentions all the methods to stop the bleeding, *viz*, pressure, styptics, ligature, escharotics, and cauteries with fire.

Albucasis⁶ mentions four methods of stopping the discharge of blood from an artery

1. By cautery
2. By dividing the artery across
3. By using the ligature
4. By styptics and bandage

Avicenna⁷, Rhases⁸ and others also mention these methods

¹ अन्न मेधादीनां शुक्लानां तांश्चैव शस्त्रच्छेदानन्तरं सूक्ष्मसिरादिबन्धनादिषु युज्यते ।

Vāgbhaṭāṭhā Kaumudī, I xxv.

² सैस्तेर्द्रिन्मिर्त्तैर्वहुधा शोनिते प्रसृते भृश ।

कार्यं यथोक्तं वैद्येन शोनितस्यापनं भवेत् ॥

Suśruta Samhitā, IV, 1.

³ Celsus, v 26

⁴ Galen Meth. Med. v

⁵ Paulus Aegineta, IV in vol II P. 127. Syd Soc Ed.

⁶ Albucasis Chirrug. 1 58

⁷ Avicenna Cantic. II, 2, and Collig. vii, 23

⁸ Rhases Divis. 39, Contin. xxviii.

for arresting hæmorrhage. Thus it becomes apparent that the use of ligature for stopping bleeding was well known to the ancient surgeons and the present methods of arresting bleeding are only the revival of the old practice. Adams¹ concludes "It appears, therefore, that the use of the ligature for stopping hæmorrhages was well understood by the ancients, and had never been lost sight of even in the darkest ages"

¹ Adam's Commentary on Paul, vol II p 132

CHAPTER VI.

THE ŚĀSTRA OR THE SHARP INSTRUMENTS

1 THE MANDAIĀGRA OR ROUND HEADED KAMĪ.

It is described as a round or circular headed cutting instrument, having a length of six anguli. Two sub-varieties are noted—one with a circular edge and the other shaped like a razor (Dallma)¹. Vāgbhatā², however, describes the blade to be shaped like the index finger when its nail points towards the palm of the hand. This would then resemble the decapitating hook of Ramsbotham.

It is said to have been principally used for the operation of cutting through and scraping³, so it is recommended to be used

¹ मण्डपमित्राय यच्च तत् मण्डपनाय तच्च द्विविधम् तथाहि—

यद्यपि मण्डप इव चुर सम्यानमेव वा ।

मण्डपनायस्य जानीयात् प्रमाणान् पटङ्गुलम् ।

Nivandha Samgraha, viii

² मण्डपनाय फले नैषा तर्जन्यन्तर्नखाकृतिः ।

लेखने छेदने योज्य पोथिकी गुणिकरदिषु ॥

Astānga Hṛdaya Samhitā, I xxvi

मण्डपनायं, मण्डपनाय नाम शस्त्रं, फलं, फल प्रदेष्टे, तर्जन्यन्तर्नखाकृति स्यात्, अन्तः, अन्तर्निर्तो मखः, अन्तर्नखः, तर्जन्या अन्तर्नखः, तर्जन्यन्तर्नखः, तस्यैवाकृति राकारो यस्य तत् तर्जन्यन्तर्नखाकृतिः । तच्च पोथिकी गलशूलिकादिषु, लेखने, लेखन कर्मणि, तथा छेदने, छेदन कर्मणि, योज्यः ।

Vāgbhatārtha Kanmudī, I xxvi

फलौहे षे तर्जन्या अन्तर्नखस्तर्जन्यन्तर्नखस्तस्यैवाकृतिर्यस्य तदेवम् ।

Sarvāṅga Sundarī, I xxvi

³ तत्र मण्डपनायकरपते स्याता छेदने लेखने च ।

Sūtrata Samhitā, I viii

in the operative treatment of enlarged tonsil¹ It is also advised to be used for piercing the skull of a dead foetus in utero to help its easy extraction by other instruments So any other presenting part causing difficulty in the delivery of the dead foetus, is to be cut with it It is claimed that there is less likelihood of damaging the soft parts of the mother by this instrument than by the sharp pointed vrddhipatia²

We find that Suśruta recommends a mandalāgria knife in ophthalmic practice for scraping away the membranous expansion in the operation of pterygium³ and other ophthalmic operations,

¹ अङ्गुष्ठाङ्गुलिसन्द शेनाकृष्य गलगण्डिका ।

क्षेदयेन्मण्डलायै ण जिह्वोपरि तु सस्थिताम् ।

नोत्कृष्टश्चैव ह्रीनश्च विभाग क्षेदयेद्विषक् ॥

Suśruta Samhitā, IV १२११

² तत्र स्त्रियमाश्रास्य मण्डलायै णाङ्गुली शस्त्रेण वा शिरो विदार्य शिरः कपालान्याहृत्य शङ्कुना गृहीत्वोरसि कचाया व्यपहरेदभिन्नशिरसि चाक्षिफूटे गण्डे वा अससक्तस्यासदेशे बाहुं कृत्वा दृढनिवातत वातपूर्णादर वा विदार्य निरस्थान्वाणि शिथिलीभूत माहरेज्जघनसक्तस्य वा जघनकपालानीति ।

यद्, यदङ्गं हि गर्भस्य तस्य स्वजति तद्विषक् ।

सम्यग्विनिर्हरेच्छित्वा रक्षेन्नारीश्च यन्नत ।

गर्भस्य गतयश्चिवा जायन्तेऽनिलकोपत ।

तत्रानात्ममतिर्व्वेद्यो वर्त्तत विधिपूर्व्वक ॥

नोपेक्षेत नृत गर्भं मूहुर्त्तमपि पण्डित ।

सह्याय जननीं हन्ति निरुच्छास पयः यथा ॥

मण्डलायै कर्त्तव्यं क्षेदमन्तर्व्विजानता ।

हृदिप्रवृत्तिं हि तीचाय नारीं हिसृष्टात् कदाचन ।

Ibid, IV २४

³ अयं यत्र वलीजात तत्र तल्लगयेद भिषक् ॥

अपाङ्गं प्रेक्षमाणस्य वद्विज्ञेन समाहित ।

मुत्तुण्डग्रागृह्य मेधावी सूक्ष्मक्षेत्रेण वा पुनः ॥

नचोत्थापयता चिम कार्थमभ्युन्नत तु तत् ।

such as for vascular net-work and nodules on the eyeball¹ Cakradatta says:— that if the pterygium extends to the black part of the eye the membrane is to be raised by the point of a needle, transfixed by a *vardāśa* or hook, and leaving the pupil free, is to be excised, as Śivadāsa² explains, by the *mandalāgrā*. He also uses it to scrape away the root of any new growth in the eye³ and to perform the operation of scratching in ophthalmic surgery.

अङ्गपातभगनास्य तस्य नी याचयेत् दृढ ॥
ततः प्रणिदिनीभूतं विभिरिव विलम्बित ।
उदितं मण्डलाग्रेण तोषं न परिशोधयेत् ॥
विमुक्तं संप्रतश्चापि कृत्वा पुनश्च मण्डनात् ।
नीत्वा तन्नागकोपान्नं दिव्याग्नातिं कनीनक ॥
अगुर्भगमिदं मासं नाति व्यपक्षिमर्ति ।

Suśruta Samhitā, VI. xv

¹ मिराचानं मिराचाम् कटिनामाय युद्धिमान् ।
उदितमण्डलाग्रेण वडिशेनावलम्बित ॥
मिराम् पिडकागता या न सिध्यन्ति भेषजं ।
अगवमण्डनार्येण तामाञ्छेदनमिष्यते ॥

Ibid

² अङ्गं तु छेदनीयं स्यात् कृष्णप्रातः भवेद्वयदा ।
वडिशविमुद्रमस्य विभागज्ञात् वर्जयेत् ॥

Cakradatta, Netraroga Cikitsā

³ अङ्गं छेदनीयमिति मण्डलाग्रेणेति शेषः । समुद्रयेति सूचयेणेति शेषः । सूचयेण समुद्रमस्य उत्तोल्य अनन्तरं वडिशेन विद्धा मण्डलाग्रेण छेदयेदित्यर्थः ।

Tattva Candrikā, Netraroga Cikitsā

⁴ अर्शस्तथावर्त्मनाम्ना शुष्काणोऽर्श्वदमेव च ।
मण्डलाग्रेण तोषणेण सूक्ष्मिर्च्छिन्द्याद भिषक् शने ॥

Cakradatta, Netraroga Cikitsā

⁵ भित्त्वोपनाहं कफजं पिप्पली मधुसन्धवे ।
विलिप्तिमण्डलाग्रेण प्रच्छेदेद्वा समन्ततः ॥

1 1 1 1

A small instrument with a broad blade and a rounded cutting tip is figured by Albucasis¹ in connection with ophthalmic work. This was the scalpel for the plastic operation on the eyelid as for trichiasis. Incisions were made by this knife on the eyelids in such a way as to enclose a leaf-shaped area which was then dissected off. The lips of the incisions were then united with three or four sutures². Paul³, quoting Aetius⁴, describes the operation for pterygia —“Having separated the eyelids, and seized upon the pterygia with a hook-like instrument, having a small curvature, we stretch it, and taking a needle having a horse-hair and a strong flaxen thread in its ear (eye?), and a little bent at the extremity, we transfix it through the middle of the pterygium, and with the thread we bind the pterygium and raise it upwards, while with the hand we separate and saw as it were the part at the pupil away unto its extremity, but the remainder of it at the great canthus we cut off from the base with the scalpel used for the operation by suture, but leaving the natural flesh of the canthus, lest there be a running of the eye when it is taken away. Some stretching as aforesaid with a thread, dissect away the whole pterygium with the instrument called pterygotomos, taking care not to touch the cornea.”

Cakradatta mentions the use of the mandalāṅga for scarifying

घृतसैन्धव चूर्णेन कफानाह पुन पुन ।

विलिखिन्मण्डलाङ्गेण प्रच्छयेद्वा समन्तत ॥

Cakradatta, Netraṅga Cikitsā

¹ Milne Græco Roman Surgical Instruments, Pl ix fig 3

² Paulus Ægineta, VI viii

³ Ibid, VI xviii

⁴ Aetius, II iii 60

the tongue for bleeding in the disease called jihvākantaka (prickly tongue)¹ He also uses it in adhūpihṛā or ranula and says "The tongue is to be raised, the ranula is to be drawn up and fixed by a sharp hook, and then excised by the mandalāgra. Afterwards a strong gargle is to be prescribed"² Pālakāpya³ also describes it to have a length of nine anguli, the handle being six, and the blade three anguli long. The end is full-moon-shaped and it is directed to be used for scarification on the eyeball.

It seems that mandalāgra of different sizes and shapes were used. For the instrument used for perforating the foetal cranium in uterus would scarcely be thought fit for a delicate operation on the eyeball.

Soranus⁴ mentions a special instrument for perforating the foetal head. Rhases⁵ directs us to open the head when the child's cranium is large and cannot be brought down. Haly

¹ कण्टकेषु कफोत्थेषु निखितेष्वसजं चये ।

दिष्ययादिर्मधुयुतं काथ्यन्तु प्रतिसारणम् ॥

Cakradatta, Jihvārōga Cikitsā

निखितेति विमृश्यादिना ।

Tattva Candrikā, Ibid

² उन्नास्य जिह्वामाकृत्य वडिशेनाधिशिष्टिकाम् ।

हेदेद्यन्मण्डलायेण तीक्ष्णैर्लवणादिभिः ॥

Cakradatta, Mukharoga Cikitsā

³ लेखनं मण्डलाग्रेण कर्त्तव्यं दन्तिना भवेत् ।

Pālakāpya, III 1

पूर्णचन्द्राकृत्यायमण्डलायम् लेखनार्थमस्मि ।

Pālakāpya, III 111

⁴ Soranus, II viii, P 306

⁵ Rhases Cont xxii

Abbas¹ also advises us to open the head when it is preternaturally large Aetius² also gives a similar description Some authors recommend the polypus-scalpel or the phlebotome in embriyotomy The embriyotome figured by Albucasis³ is a straight two-edged blade, and we may conjecture that the mandalāgia used by the Hindus for perforating the foetal cranium was a similar instrument

2 KARAPATRA OR SAW

It literally means, "an instrument having the blade in the form of a hand", the fingers being represented by the teeth of the saw Others explain, as Dallana⁴ points out, the name from its resemblance to a carpenter's saw It seems that saws of various sizes were used Suśruta mentions its length to be six anguli, Vāgbhata⁵ describes it to be ten anguli

¹ Haly Abbas, Pract 13 57

² Aetius, XVI 23

³ Græco Roman Surgical Instruments, Pl viii fig 7

⁴ करपत्रमिति करवत् पत्र करपत्र यथा करोऽङ्गुलिभिराचितो भवति तद्वत् यत् कण्टकैराचितं स्यात्तत् करपत्रमुच्यते । अन्ये तु करपत्रशस्त्रं करपत्राकारमेव तच्च द्वादशाङ्गुलं तन्मात्रं वचनात् । ननु यदि तन्मात्रराज्जं द्वादशाङ्गुलं करपत्रमुच्यते तर्हि स्वतन्त्रे विरोधः कुत स्वतन्त्रे करपत्रस्य निर्दिष्टप्रमाणत्वात् शेषानि तु षडङ्गुलानि इत्यनेन वाक्येन षडाङ्गुलमेव करपत्रम् स्यात्त द्वादशाङ्गुलं नैवम् तेषाम् नामाभिरैवाहृतय प्रायेण व्याख्याता इत्यस्मात् सूत्रात् प्रायः शब्दोऽनुवर्ततेतेनायमर्थः, शेषानि प्रायेण षडङ्गुलानि एव शस्त्रमानेऽन्यत्रार्थविरोधः ।

Nivandha Samgraha, I viii

⁵ छेदेऽस्या करपत्रं खरधारं दशाङ्गुलं ।

विस्तारे द्वाङ्गुलं सूक्ष्मदन्तं स्वत्सरं वन्धनं ॥

Aṣṭāṅgā Hṛdaya Samhitā, I xxvi

करपत्राख्यां शास्त्रमाह छेदे इत्यादि करवत् पत्र यस्य तत् करपत्रं, षडङ्गुलिभिराचितो यथाकारो भवति तद्वत् यत् कण्टकैराचितं तत् करपत्रमुच्यते । करपत्रं करात् ख्यातः । करपत्रं खरधारं, खरा, तीक्ष्णं, धारा यस्य तत्तथाविधम्, तथा दशाङ्गुलम्,

long and tapering handle, while the steel blade is a saw, twelve or sixteen inches long. The blade of the instrument is described as rough and serrated, and this is the only instrument that need not have been changed.

The handle of the saw should be well formed and pegged for the fingers to grasp well. Sometime it is recommended for the finger to be pegged.

Several instruments are mentioned by the Greek and Roman authors in the description of operation on the bones. Celsus¹ mentions a knife used in the amputation of a gangrenous limb. Wrote a force for the fracture of the bones of the head, Paul² says, "But the mode of operating with saws and the instrument called *chamaedon* (*trapan*) is condemned by the moderns and is disallowed." Evidently he means flat cranial saws. Galen³ also mentions the "knife-shaped saws."

In modern times the saw is still used for identical purposes in surgery.

There is no mention of trephine in Hindu surgery though Jivaka (500 B.C.) is said to have practised cranial surgery with success. Pandit Vallabha describes⁴, in his *Bhojaprabandha* or

देहं न हन्यते परितोऽपि, तदा विनाशं दाह्यते, परितः चक्षुःशयपरिमितं तथा सूक्ष्मं दक्षं दृष्ट्वा मन्त्रादीनां प्रसादं यत् तत्तदाविधं, तथा सत्सुरवसानं, तस्य खड्गादि मुष्टि, बन्धनं, फीलादिना बन्धनं, तस्यस्य बन्धनस्य ते तस्य बन्धने, शीघ्रं तस्य बन्धने यस्य तत्तदाविधं । तस्य चक्षुःशयं, तदंशं कर्माणि यीयते ।

Vāgbhātākritha Karmudī, I. xxvi

¹ See foot-note I, p. 230

² Celsus, VII. xxxiii

³ Paul, VI. xc

⁴ Galen, XVIII. 33

⁵ See *Mahāvāṅga*, VIII. 118. Sacred Books of the East. Vol. xvii

⁶ See foot-note I, p. 60

Anecdotes of King Bhoja, a surgical operation performed on the king. He was suffering from a severe pain in the head. Medicines did him no good, and so to give relief, surgical interference was thought necessary by two brother surgeons who happened to arrive in Dhari at that time. They are said to have administered a drug called sammohini to render him insensible. They then trepanned the skull and removed the real cause of his complaint. They closed the opening, stitched the wound and applied a healing balm. They are then said to have administered to the king another drug called sañjibanī to accelerate the return of consciousness.

Trephine was well known to the ancient Greeks and Romans. Hippocrates¹ mentions a trephine or a saw having a circular motion, in the treatment of injuries to the head. Paul also mentions trephine, the use of which is, he says, condemned by the moderns. Sprengel² remarks, that "Galen was averse to the use of the trepan, though he performed the operation on the head occasionally."³

3 VRDDHIPATRA

This sharp cutting instrument is called vrddhipatra from its resemblance to the leaf of a medicinal plant called vrddhi. Two varieties of this knife are described by Vāgbhata⁴—one is

¹ Hippocrates, III, 371, 374

² Hist. de la Méd., 18

³ Adam's Commentary on Paul, VI, 10 Vol. II, p. 436

⁴ वृद्धिपत्रं चुराकारं छेदं भेदनं पाटने ।

भृज्वर्यमुच्यते शोफं गन्धीरे तु सदन्वया ।

नताय प्रसृतौ दीर्घं क्रस्ववक्त्रं यथायथं ॥

One form of the viddhipatra resembles in shape the razor used by the barbers,—not the English razor that has now become common in Bengal, but the country-made razors which are still used by the barbers in the North-West Provinces

Suśruta recommends the use of razor, scissors and pinchers for shaving the parts before operation, for “the hairs”, he says, “prevent the healing up of the wound rapidly”¹ He again uses vrddhipatra as a knife and observes —“If bitten by spiders whose bites are amenable to treatment, the area of the wound should at once be excised out by the viddhipatra, and then actual cautery applied by the red-hot jāmvausta probe till the patient requests for its withdrawal”²

Suśruta uses the vrddhipatra knife for the removal of the scrotal tumour and says³ “The scrotal tumour is to be well fomented and bandaged The patient should then be cheered up, and leaving the testicles intact, underneath the median raphe, the tumour should be excised by vrddhipatra knife The fatty tissues being

¹ रोमाक्रीणीं ब्रूणी यस्तु न सम्यगुपरोदति ।

चुरकर्तरीसन्द शै सप्तरोमाणि निर्हरेत् ॥

Suśruta Samhitā, IV 1

² साध्याभिराभिलुताभिर्दष्टमावस्य देहिन ।

वृद्धिपवेण मतिमान् सम्यगादशमुद्धरेत् ॥

माम्बष्ठेनाग्निं तमेन दहेदाकर वारणात् ।

Ibid, V 711

³ सिद्धा चावेष्ट्य पङ्केन समाश्वासयतु मानव ।

रुचेत् फले सेवनीञ्च वृद्धिपवेण दारयेत् ॥

मेदस्ततः समुद्धृत्य दद्यात् कासीससैन्धवे ।

बभ्रूयाञ्च यथोद्दिष्ट ।

Ibid, IV xix

removed powdered ferriculphur and rock salt are to be dusted over the acid and proper bandage applied "

Arddhiputra was also used by the ancient veterinary surgeons. Jayaditya Sam wrote: "The knife known as Arddhiputra is shaped like a lance-point. It is three anguli long and should be used by the vet. to incise a suppurated abscess." In Pālāṅgya's text we find that "it is ten anguli longer, the handle being ten anguli and the blade four anguli long and three anguli broad. It is used for castration and excision." He uses it also in opening a wound after well ascertaining its course by means of a probe.

Hypodermic injection.—The use of hypodermic syringes is not known to the Hindu. They were acquainted however with the hypodermic method of exhibition of drugs. Śūnugadhara¹

[illegible]

ՀԱՅԱՍՏԱՆԻՔ, XIV v 22

१. मन्त्रस्य दक्षिणतमं च पादमि(मि)तम मि(मि)तम वा ।
२. यत्तद्विदित्ति विद्यायां यत्तद्विदित्ति पादमिद्विषय ॥

Իսկով նրան, III iv

रहिषते च नामानां सुव्यापारो मया ।

Իսկուհի արեւ, III :

१ अत्र नियमद्वयसंश्लेषाद्विधित्वा मयत्तित्वा वारण्यमभिविद्वास्त्वाऽऽद्य(त्रि)त्य स्तम्भानुगत
मतिमः । अत्रानुगतं तादृशमप्यत्रापि च विदित्वा हृदयपक्षेण शब्देष्वनुगीम प्रयप्रति, रक्षाध-
र्येदं दृष्टव्यम् ॥

Pāṇinīya, III xv

५ मन्थिवा परिष्णाः अगानिर्वाण्डितम् ।
तत्र प्रदेष्टुं दद्यात् पितृ गृह्णाकृते कृतम् ॥
निनायशङ्कम् पीडा विपत्तौ नृधर्मो तथा ।
अन्नापि यातृजाप्रीतिं प्रथमं याति विगतम् ॥

Sringadhara Sringarha, III xi

directs us to scarify a part with a razor and then apply an ointment of guñjā (*Abius precatorius*) in sciatica, scrofulous glands of the neck, etc. For treating a person in the state of unconsciousness caused by the derangement of all the humours, he directs us to scarify the anterior fontanelle with a razor, then to apply as much medicine as can be carried on the point of a needle to the part and rub it with fingers¹. The medicine is to be prepared thus —take aconite 1 pala, quicksilver 1 śāna, mix, and put inside two sorābas or earthen basins smeared with powdered glass and placed face to face. Apply some external application over this and put it on fire for six hours. Then open the basins, take the soot collected on the upper basin and deposit it in a glass vessel quickly to prevent exposure. Caraka² also advises us to apply a medicinal paste on a cranial incision, shaped like

¹ विष प्लवित सूत शणिकश्चर्येद्वयम् ।
 तच्चूणं सम्पूटे च कृत्वा काञ्चलितमरावयो ॥
 मुद्रा दत्त्वा च सगोष्य ततश्चुल्लया निवेशयेत् ।
 वह्निं शनैः शने कुर्यात् प्रहरद्वयं सव्यया ॥
 तत उत्पाद्य तन्मुद्रामुपरिस्थे मरावके ।
 मलग्नो यो भवेद्धूम त गृह्णीयाच्छनैः शनैः ॥
 वायुस्पर्शो यथा नम्रात तत कुप्या निवेशयेत् ।
 रस सूचीमुखिलग्रस्कूप्या निर्याति भेषजम् ॥
 तावन्मात्रो रसो देयो मूर्च्छिते सन्निपातिनि ।
 क्षणेण प्रक्षिते मूर्च्छितं तदङ्गुल्या च चर्धयेत् ॥
 रक्त भेषजं सम्पर्कान्मुर्च्छितोऽपि हि जीवति ।
 तथैव सर्पदष्टस्तु मृतावस्थोऽपि जीवति ।
 यदातापो भवेत् तस्य मधुरं तव दीयते ॥

Sārngadhara Samgraha, II २११

² विषद्रूषितं कफमार्गं स्त्रोतसरोधरुद्धवायुय ।
 मृतावस्थं श्मशानं स्यादसाध्यनिर्हृदिहीनम् ॥

the foot of a crow in case of snake-bite when he becomes unconscious but his life is not completely despaired of

1. NAKHA ŚASTRA OR NAIH PALIḤ

Sūśruta¹ mentions its length to be eight anguli Dillana² says that its blade is two anguli long and one anguli broad Vāgbha³, on the other hand, describes the length to be nine anguli Arunadatta⁴ thinks it to be a double instrument, one end having a straight edge and the other an oblique one Some explain⁵ that two different kinds of nakha śastra—one with a straight and the other with an oblique edge—are directed to be used

नखशस्त्रं अष्टाङ्गुलं त्रिंशत्तुल्यं कृत्वा कर्तव्यम् ।

तन्ना नखात् कटभौ कटकोट्यना प्रधानतः ॥

Caraka Samhitā, VI xxv

¹ सत नखशस्त्रेदण्णतटाद्गुणे गुण्योवत्यन्ते ।

Susruta Samhitā, I viii

² नखशस्त्रमिति गणनां हेतुना शस्त्रं नखशस्त्रं तस्य फलं द्वाङ्गुलायाम् एकाङ्गुलं विन्युतम् ।

Nivan lha Samgraha, I viii

³ यक्रजुंधारं तिसृषु नखशस्त्रं नवाङ्गुलम् ।

गुण्यगुण्योदृतिर्देहेन प्रच्छान् भिखने ॥

Artāṅga Hṛdaya Samhitā, I xxvi

⁴ नखशस्त्रं, नखच्छेदकं प्रसिद्धं । तच्च यक्रा चतुर्जुंधारा यस्य तदेवम् । तस्यैकं गुणं यक्रमन्यदृजु स्पष्टम् ।

Sarvāṅgasundarī, I xxvi

⁵ नखशस्त्रमात्रं यक्रजुंधारमिच्छादि नखानां हेतुनाय शस्त्रं नखशस्त्रं तत् द्विसुखं द्विर्द्विं प्रकारं सुखं यस्या तद्विसुखं तथा यक्रजुंधारं एकं यक्रं धारं अपरम् चतुर्धारां स्यात्, तथा नवाङ्गुलं उभयोर्मपि दैर्घ्येण नवाङ्गुलपरिमितं तच्च नखशस्त्रं शल्योद्भृत्त्यादी योज्यं शन्यानां कण्टकदीनामुद्भृति कारणं शल्योद्भृतिं प्रच्छान् चिरा इति यस्या प्रसिद्धिं लेखनं धौचन् इति लोके ।

Vāgbhatārtha Kaumudī, I xxvi

They are principally recommended for cutting, puncturing and scarifying¹, and also for the extraction of needles and minute foreign bodies from the soft parts

There is no mention of a many-bladed scarificator in the surgical books of the Hindus, but its office was performed by the *nakha śastra*, in wet cupping, by making parallel incisions close to one another

Paul² alludes to an instrument compounded of three blades joined in such a way that at one stroke, three scarifications were made, but he prefers a single scalpel for the purpose

Pālakāpya mentions an instrument called *rampaka*³, having the handle ten *anguli* and the blade three *anguli* long. It is to be used for paring the nails and cleaning the feet of the elephants

5 MUDRIKĀ

It is described to be a cutting instrument of the size of the last phalanx of the index finger⁴, it is also called *anguli-śastra* or finger-knife. Vāgbhata describes this instrument but not clearly. He says that the mouth of the *anguli-śastra* looks as if coming out of a ring, and the blade is half an *anguli* wide. A ring, having the size sufficient to admit the terminal phalanx of the index

¹ वृद्धिपत नखशस्त्र मुद्रिकोपलपदकाङ्घ्रि धारानि छेदने भेदने ।

Suśruta Samhitā, I viii

² Paulus Ægineta, VI xli

³ रम्पकस्त्राङ्गुलमुखो दशाङ्गुलवत् पादशोधनार्थं नखच्छेदनार्थं चेति ।

Pālakāpya, III, xxx

⁴ प्रदेशिचर्यपर्वप्रदेशप्रसाधामुद्रिका ।

Suśruta Samhitā, I viii

finger, should be soldered to it. The base of the instrument has a thread tied to it¹

It is recommended to be used for cutting through neoplasms in the throat. In its uses, Vāgbhata says that it resembles the mandalāgra and vridhīpatra, and so was sometimes required for perforating the skull of a dead foetus in the uterus of its mother²

Dr Simpson of St Andrews (1744) is said to have invented an instrument, a "ring scalpel" for opening the skull. It consists of a loop of steel, through which the finger is to be passed

1

कुर्यादङ्गुलिगन्धक ।

मुद्रिकानिर्गतसुखं फले फलोद्देशे ।

योगतो हृदिपतेषु मण्डलापे वा सम ।

तत्प्रदेशिन्य पर्व्वप्रमाणार्पणं मुद्रिकम् ।

सूत्रवद् गलस्रोतो रोगहेदन भेदने ॥

Aṣṭāṅga Hṛdaya Samhitā, I xxv

कुर्यादित्यादिना अङ्गुलिगन्धकं व्यञ्जितम् । मुद्रिका अङ्गुरीयकेण निर्गतं निष्क्रान्तं सुखं यच्च तत्तथाविधं मुद्रिकानिर्गतसुखं तदा फले फलोद्देशे अङ्गुलाग्रतः अङ्गुलिप्रमाणं विस्तारं अङ्गुलिगन्धकं अङ्गुलिनामं गन्धं कुर्यात् । तच्च योगतः प्रयोगे हृदिपतेषु मण्डलापेषु वा समतुल्यं भवति । शीतलेन हृदिपतेषु योज्यं किम्वा हेदनं भेदनं पाटने मण्डलाग्रवत् योज्यमित्यर्थः । तदित्यादि तदङ्गुलिगन्धकं प्रदेशिन्य पर्व्वप्रमाणार्पणं मुद्रिकं कुर्यादिति योज्यम् । वैद्यस्य प्रदेशिनी नाम्नी अङ्गुलिस्तस्या अयं यत्पर्व्वं तत्तथा तस्य यत् प्रमाणं परिमाणं तदपेक्षा तत् प्रवेशेपयुक्ता मुद्रिका यस्य तत्तथाविधम् । मुद्रिका सुदरी आङ्गुली इति वा ख्याता । तथा सूत्रवद् मूलदेशे सूत्रवद् तच्च गलस्रोतो गतानां रोगाणां हेदने भेदने च योज्यम् ।

Vāgbhātārtha Kaumudī, I xxv

2 चिकित्सी नाम तौ सूदौ शस्त्रदारणमङ्गतम् ।

मण्डलाङ्गुलिं शस्त्राभ्यां तवकर्मं प्रशस्यते ।

हृदिपतं हि तीक्ष्णार्थं न योनाश्चकारयेत् ॥

Aṣṭāṅga Hṛdaya Samhitā, II 11

and from which protrudes a sharp pointed blade about an inch long, by which the cranium was pierced¹

In the pseudo-Hippocratic treatise² a knife to fix on the thumb and dismember a foetus in utero is mentioned. This knife is called by Turtullian³ the "ring knife", whereby the limbs are advised to be cut off in the womb. It is interesting to point out that *mudrikā* also means a ring.

The veterinary surgeons still use a scalpel blade mounted on a ring⁴, through which a forefinger is passed to dismember foals and calves in exactly the same way.

6 UTPALAPATRA

This knife is described to have the shape of a petal of the blue lotus. The end is long, sharp and pointed. The *utpalapatra* is *dīṅgha-vaktra* or long bladed, while the *aiddhadhāna* is the *brava-vaktia* or short bladed knife⁵. It is to be used for cutting through and puncturing the parts.

¹ Ed. Med. Essays, vol. V, Part I, P. 445

² Hippocrates, I. 463

³ De Anima, 26

⁴ Græco Roman Surgical Instruments, Pl. VII fig. 1

५ दीर्घऋक्षवक्त्रं यथायथ ।

उत्पलाध्यङ्गधाराख्ये भेदने छेदने तथा ॥

Astāṅga Hrdaya Samhitā, I. xxvi

उत्पलपत्राख्यध्यङ्गधाराख्ये शस्त्रे आह उत्पलित्यादि उत्पलस्य अध्यङ्गधारस्य ते आख्ये ययो शस्त्रयो स्ते उत्पलाध्यङ्ग धाराख्ये शस्त्रे तथा, यथाक्रमं दीर्घं ऋक्ष वक्त्रे भवत । तत्र उत्पलाख्य दीर्घवक्त्रं, अध्यङ्गधाराख्य ऋक्षवक्त्रमित्यर्थः । उत्पलशब्देन उत्पलपत्राय शस्त्रं गम्यते तन्मान्तरदर्शनात् । तस्य फलस्य उत्पलपत्रकारत्वादुत्पलपत्रमिति सूचितम् । अधिकमङ्गं धारा यस्य तत अध्यङ्गधारः । हन्तफलयोर्मध्ये फलस्यैव किञ्चिदधिकं दैर्घ्यमिति वर्तते । तच्च अष्टाङ्गुलायतं उरसि अङ्गुलं विस्तारः ।

Vāgbhatārtha Kaumudī, I. xxvi

In the *Āśvavaidyaka*, the *utpalapatra* and *viṇipatra* knives are recommended to be used in puncturing the veins in phlebotomy¹ "The surgeon who is practically acquainted with the methods of puncturing the veins, should use the *utpalapatra* and *viṇipatra* knives for the purpose"

When used for puncturing the large veins the knife is recommended to be encircled with thread at a short distance from the end to prevent unnecessary injury to the vessels by plunging the the knife deeply²

Hippocrates similarly "guards his phlebotome in the surgical treatment of empyema, by having it wound round with a rag, leaving the breadth of the thumb nail at the point"³

Both the *utpalapatra* and *viṇimukha* knives are thus described in the *Āśvavaidyaka*⁴ The "*viṇimukha* knife should be six anguli long and half an anguli wide The *utpalapatra* should also be similarly made"

The *utpalapatra* knife is recommended to be used for incising

¹ शस्त्रेणोत्पलपत्रेण वीरिपत्रेण वा भिषक् ।

गिराविधिविधिं सम्यग् दृष्टवाग्मां प्रयोजयेत् ॥

Āśvavaidyaka, XIV v 23

² सुवक्ष्ये च सुवेष्ट्य सुगव शस्त्रस्य वृत्तिमान् ।

यथाप्रमाणं संस्थाप्य ततो वित्तावयेत् गिराम् ॥

Ibid, XV v 35

³ Hippocrates, II 258 Kuhn's Ed and I 88 Syd Soc Ed

⁴ अर्द्धाङ्गुलन्तु विस्तीर्णं कूर्यच्छस्त्रं पङ्कजुलम् ।

नाम्ना वीरिमुखं सम्यक् तथा चोत्पलपत्रकम् ॥

Āśvavaidyaka, XIV v 21

the abdominal parietis of the horse, then a tube is to be pushed through the wound in the operation of paracentesis abdominis¹

The phlebotome used by the Greeks is nowhere described in their books, but from considerations of all the various operations to which the instrument was put bears out the fact of its being a sharp pointed, double-edged and straight lancet. The phlebotome of the Greeks might have then resembled in shape the utpalapatra of the Hindus. It was used by the Greeks for various operations besides phlebotomy, as for the opening of abscesses such as the parulis or gum boil², puncture of cavities containing fluid as in opening the abdomen for ascites³, incising the tunica vaginalis as in excision of hydrocele sac⁴ and for dissecting out warts⁵ and sebaceous cysts⁶

It is interesting to note that Pālakāpya⁷ mentions utpalapatra and describes it to be eight anguli long, one and a half anguli broad and double edged. He uses it for puncturing vessels etc

¹ हृदयस्योपरि भागे ऊर्ध्वभागे च नाभित ।

अधोवा नाभित कूर्यच्छेदन घतुरङ्गुले ॥

शस्त्रेणोत्पलपत्रेण वामभागे विचक्षण ।

एकमेवाङ्गुलं शस्त्रं कुक्षीचापि प्रवेशयेत् ॥

वेधव्रणे ततस्तस्मिन् नालिका वस्त्रवेष्टिताम् ।

प्रचिप्य गालवेद्वारि यावद्द्विकोष्ठलाघवम् ॥

Aśvavaidyaka, LII vs 25, 26 and 27

² Paul, VI xlvii.

³ Ibid, VI, L

⁴ Ibid, VI lxi

⁵ Ibid, VI lxxviii

⁶ Ibid, VI xlv

⁷ ब्रीहिसुखप्रमाणमुत्पलपत्र भेदनार्थं ।

Pālakāpya, III xxx

7 ARDHAADHĀRA.

It is difficult to ascertain the exact shape of this knife. Some translate it as a "single edged knife,"¹ but it really means, as Dullien explains, an instrument which has a sharp edge for half the length.² It is also called cakradhāra. Vāgbhata has a variant reading—adhyarddhadhāra—which means an instrument having a sharp edge for more than half the length.³

It is eight anguli long, the blade is two anguli long and one anguli wide, and the handle six anguli long. It is to be used for incision and division of parts of the body.

8. SŪCĪ OR NEEDLES.

Three needles are recommended to be used for applying sutures. They should be strongly made and rounded in shape. At one end they are flattened, grooved and pierced with an eye for the suture. The groove is said to have been intended to be the bed of the suture during stitching to prevent it from doing any harm to the tissue. In fleshy parts such as the thighs, a three ribbed needle, three anguli long, is advised to be used. For less fleshy parts and wounds about the joints, a similar straight needle but two anguli long should be employed, while for suturing the wounds of the stomach, intestines, scrotum and the vital parts of the body, preference is given to a needle curved like a bow, two and a half anguli long and having the pointed end

¹ Harkness's Translations of Susruta Samhitā, Bibl. Ind. I. viii.

² 'अर्धधारमिति, अर्धं धारा यस्य तत्, अर्धधार, चक्रधारमिति प्रसिद्धं' तस्य अष्टाङ्गुलायत्' उरसि अङ्गुलं विस्तारं दद्याद्गुणफलम् । अन्ये त्वध्यर्धधारमिति पठन्ति, अधिकमर्धं धारायसां तत्, अध्यर्धधारम् ।

Nirandha Samgraha, I. viii.

³ See foot note B, P. 240.

of long *nævus* needles, fixed in wooden handles, and having then eyes near then points, double whipcord ligatures in opposite directions beneath the tumour, then cutting through the nooses, and tying together the contiguous ends of the ligatures until the whole of the growth is encircled and strangled by them”

There are many instances of the use of surgical needle by the Greek and Roman Surgeons. Needles of different sizes are recommended. Celsus mentions a large needle in describing the operation of suturing the abdominal parietis¹, and another, evidently a small needle, which is said to have been used in the treatment of staphyloma of the cornea². The needles were either round or three-cornered. “A few three-cornered needles of Roman origin have been found, although they are rare” (Milne³). Paul uses a needle in suture of the upper eyelid, and other modes of operating for trichiasis⁴, for the repair of wounds of the peritoneum⁵, and recommends a large sized needle containing a double thread to close the peritoneum in the operation for enterocoele⁶.

Pālakāpya mentions *sūcī* or needles for stitching wounds⁷. They are eight angulī long, shaped like the tusk of an elephant and are either three ribbed, or four ribbed, or round, smooth and

¹ Celsus, VIII, 111

² Ibid VII 111

³ Græco Roman Surgical Instruments, P 75

⁴ Paulus Ægineta, VI 111.

⁵ Ibid, VI 111

⁶ Ibid, VI 111

⁷ सूची सेवनाय । अष्टाङ्गुलं नागदन्ताकृति । चाक्षा चतुर्गुणा वा दृढा समाहित

यथा शलाका वने वस्त्रविधृत्यम् ।

strong He reserves curved three-cornered needles for fleshy parts and round needles for skin, veins, nerves and arteries¹

Caraka recommends the use of leeches, knife and needles for extracting blood from the piles² He also advises us to use needles for picking the patches of leprous spots³ before the application of leeches for extracting blood

9 KUŚAPATRA

It is a form of knife resembling in shape the leaf of a kuśa grass (*Poa cynosuroides*)⁴ The instrument should be six anguli long (Suśruta), the blade measuring two anguli (Vāgbhata)⁵

- १ या सूच्यस्त्रिविधा प्रोक्ता शस्त्राध्याये सस्थिता ।
 नागदन्ताकृतिर्हृत्ता त्रिकोणा चेति निश्चयात् ॥
 अस्थ्याश्रित नागदन्तया मासज च त्रिकोणया ।
 त्वक्क्षायु धमनीस्थ च शिराज चैव हतया ।
 आहार्यं सर्वयन्त्राणां सूच्या सीवनमित्यने ॥

Pālakāpya, III 1

- २ जलौकीमि तथा शस्त्रे सूचीभिर्वा पुन पुन ।
 अवर्तमान रुधिर रक्ताशैभ्य प्रवाहयेत् ॥

Caraka Samhitā, VI 1x

- ३ प्रच्छिन्नमल्पं कुष्ठ विरेचयेद्वा जलौकाभि ।

Ibid, VI vii

- ४ कुशपत्रमिति, कुशपत्रतुल्य कुशपत्रं तन्मानमाह .—

अङ्गुलैरुचक विद्यादङ्गुल फलमुच्यते ।

दन्तं सप्तात् वङ्गुल मध्ये कुशपत्रस्य लक्षणम् ॥

Nivandha Samgraha, I viii

- ५ कुशाटी वदने श्वाये ब्रह्मलस्रात्तयो फल ॥

Aṣṭāṅga Hṛdaya Samhitā, I xxvi

कुशाटीवदने हे शस्त्रे, श्वाये विस्त्रावण विषये योज्ये । तयो कुशाटी वदनयो फल ब्रह्मल, अङ्गुलद्वय परिमित सप्तात् ।

Vāgbhatārtha Kaumudī, I xxvi

and the handle four anguli, but according to Bhoja, the handle is three anguli long. It is to be used for draining pus from abscess. The handle has a ring like ornamentation, about one anguli in diameter. Another variant reading describes the blade, the ring, and the handle to have the lengths of two, three, and two anguli respectively. This would make the total length of the instrument to be seven anguli, so evidently there is some lapsus calami in the second reading.

Cakradatta uses kuśapatra as a bleeding lancet and says¹ "Out of the twelve vessels that lie on the sides and underneath the tongue, select the two large bluish vessels on either sides of the tongue, raise them up by vādīśa or hook and puncture them by the kuśapatra knife and then, after bleeding, apply a paste of treacle and ginger to the wound". In the Yogaratnākara², the author advises us to adopt this method of bleeding, in the treatment of tumours in the neck.

Pālakāpya mentions kuśapatra and describes it as being shaped like a kuśa grass³. It is nine anguli long—the handle being

¹ जिह्वाया पार्श्वतोऽधस्ता शिरा द्वादश कीर्तिता ।

तासा स्थूलशिरे कृण्वे विध्यात् ते तु शनैः शनैः ॥

वडिशेषेव सगृह्य कुशपत्रेण बुद्धिमान् ॥

Cakradatta, Galaganda Cikatsā

² जिह्वाया पार्श्वयोर्मलाच्छिरा द्वादश कीर्तिता ।

तासा स्थूले शिरे द्वे च च्छिन्द्यान्ते च शनैः शनैः ।

वडिशेषेव सगृह्य कुशपत्रेण बुद्धिमान् ।

सुते रक्ते ग्रथे तस्मिन् दद्यात्तस गुडमाद्रकम् ॥

Yogaratanākara, P 321

³ नवाङ्गुल कुशपत्र । पञ्चाङ्गुल वृत्त । चतुरङ्गुलम् पत्र । अध्वार्धाङ्गुलविक्षुत-
मुभयतो धार । कुशपत्राकृति गन्धरीरपाकभेदनार्थं षडङ्गुल वृत्तम् अध्वार्धाङ्गुल पत्र ।

Pālakāpya, III xxx.

five or six angula and the blade four angula long. The blade is one and a half angula wide and is slightly edged on both sides (i.e., double edged). It is used for the incision deep 1 angula.

10. *Ābhyaṅga*.

The instrument is described to have the shape like the tail of the gajavallabha bird or a fish (Dallavāṇa, *op. cit.*)—a bird having in the middle of its body a sharp beak, the blade more or less two and the handle four angula. So it is used for the incision on the line apertures to which it is to be made in function. Bhogya is of opinion that its blade is one and the handle seven angula long.

11. *Saṁgrahaṇa*.

The instrument is a pair of forceps resembling the face of the long beaked bird called *caraka*. Dallavāṇa describes two varieties of the bird, one with white shoulder, and the other with a red head. It is the former bird which is referred to here*. Susruta describes its length to be ten angula, while Dallavāṇa mentions the length to be twelve angula.

* अष्टोसुतमिति, अष्टो अश्वदेवो नाम पतिर्विशेषः तमसुतवन्मुतः यस्या तत् अष्टोसुतः तदाधीनः —

इदं समाहृतं विद्यात् तस्मादेव जन्मिष्यत् ।

• अष्टोसुतः प्रकारं हि पाप्मद्ब्रह्मण्यतम् ।

Sivandha Saṁgrahaṇa, I. viii

* शरणासुतमिति, दीर्घवयुः पतिर्विशेषः स इतिविधः, धन्यदायका इत्युगीर्षयः धन्यदायकायाः शरणातिः यज्ञा तमसुतवन्मुतः तस्या शरणाः शोभते कर्षरीतिः यस्या सायः शरणाहृत्याः चलनमासा कुर्यात् ।

Ibid

* दशाहृत्या शरणीसुखी सा कर्षरीतिः कथ्यते ।

Susruta Samhitā, I. viii

It is recommended to be used for evacuating abscess¹, etc. Suśruta mentions karttari as a synonym but Vāgbhata counts it as a separate instrument. He describes karttari as a pair of scissors used by the barbers for clipping hair and is said to have been necessary for dividing the nerves, ligaments and fine hairs².

12 ANTARMUKHA

Suśruta describes another variety of scissors, used principally for evacuating abscesses. It is so named, for its straight cutting edges are within its curved claws³. It is said to be six anguli long and one and a half anguli broad⁴. It seems that the curvature of the blade varied widely, and Vāgbhata describes a variety called

¹ स्नाय्वे शराय्यास्यविकृच्छिके ।

Astāṅga Hrdaya Samhitā, I xxvi

स्नावे विस्वावनविषये कर्मणि शराय्यास्या विकृच्छिके द्वे शस्त्रे योज्ये । तत्र शराय्यास्य शरारीमुख शरारी दीर्घचक्षु पक्षिविशेष तस्य मुखवदास्य यस्य तत् शराय्यास्य, तच्च चलत्फलं दशाङ्गुलं दीर्घं कार्यम् ।

Vāgbhatārtha Kaumūdī, I xxvi

² स्नायु सूक्ष्म कचच्छेदे कर्त्तरी कर्त्तरीनिभा ।

Astāṅga Hrdaya Samhitā, I xxvi

कर्त्तरीशस्त्रमाह स्नायित्यादि कर्त्तरीनामशस्त्र कर्त्तरीसदृशं तच्च स्नायुच्छेदने सूक्ष्मकेशच्छेदने च योज्यम् । कर्त्तरी काटारी इति यस्य प्रसिद्धिः ।

Vāgbhatārtha Kaumūdī, I xxvi

³ अन्तर्मुखमिति मध्यमुखं तल्लक्षणमाह—

अष्टाङ्गुलप्रमाणेन जिह्वाधारेण चापुतम् ।

शस्त्रमन्तर्मुखं नाम चन्द्रार्द्धं इव चोद्भूतम् ।

Nivandha Samgraha, I viii

⁴ तद्वदन्तर्मुखं तस्य फलमध्यर्द्धमङ्गुलं ॥

Astāṅga Hrdaya Samhitā, I xxvi.

addhacandra¹ or “half-moon faced” scissors in which the blades are curved like the half-moon. It has the length of eight angula, the blade measuring one and a half angula. This is also to be used for letting out pus from abscesses.

Hārīta, however, mentions a sastra, called also addhacandra or half-moon, but he recommends its use for excising the prolapsed arms of a dead fetus to effect its delivery.² This instrument cannot but be a knife, for it seems difficult to cut off the arm, even of a fetus, with a pair of scissors. Moreover, intamukha has never been credited with the power of excising the arm.

1.3. TRIKĀRĪCAKA

It has been translated in English as a thin-edged sharp instrument or trocar. Wise, Dutt and Hoernle agree to mean by it a trocar. But it can be better explained if we understand by the term an instrument consisting of three needles fixed on a round

‘अपरश्च विस्तारश्च गम्यमानः तददित्यादि तदत् कुशाट्रीषदनवत्, अन्तर्मुखं अन्तर्मुखं’ नाम
गम्य साग्रे योग्यं तस्य अन्तर्मुखस्यफलं अर्धचन्द्राकारं स्यात् । आधि अधिक अर्धं अध्यह ।
सर्दिक्कमद्रुणमित्यर्थः ।

Vāgbhatārtha Kanmūdī, I १११

¹ अर्धचन्द्राननं चैत तयाध्यजाद्गुणं फले ॥

Astānga Hīdaya Samhitā, I १११

अन्तर्मुखस्य प्रकारभेदमाह अर्धचन्द्राननमित्यादि एतत् अन्तर्मुखं, अर्धचन्द्राननं अर्ध-
चन्द्राकारमुखश्च भवति, तदपि तदत्, कुशाट्रीषदनवत् स्वाय्ये योग्यं । तच्च फले अर्द्धाङ्गुलं
अर्द्धाङ्गुलपरिमाणं फलमित्यर्थः । अर्धचन्द्राकारमुखत्वात् अस्य शस्त्रस्यापि अर्धचन्द्राननमिति
संज्ञेति बोध्यः ।

Vāgbhatārtha Kanmūdī, I १११

² अथवाहचन्द्रेण शस्त्रेणैव स्रतगर्भस्य बाहुयुगलं सञ्चिद्य बाहूनि सारयेत् ।

Hārīta Samhitā, III, 11

wooden handle¹ According to Suśruta, the length of the instrument is six anguli But others describe it as eight anguli long, the blade and the handle measuring three and five anguli respectively² The distance between the edges is the breadth of a grain of rice The end of the handle is ornamented with a circular metallic plate as a ring

It is recommended to be used for evacuating abscesses and for draining blood from the nasal polypus

Caraka³ mentions an instrument called kūcca and says — “After fomenting and thus softening the rounded nodules (of leprosy) which are fixed and hard, by heated stones and fumigations through tubes, they are to be injured by the kūcca and the blood that oozes out, should be wiped away ”

Two other instruments are described by Vāgbhata as being constructed on a similar principle One is named kūcca and the

¹ चिकृर्चकमिति त्रय कूर्चा यस्य तत् विकूर्चकम् । कूर्चं कूर्चौ इति लोके ।

Vāgbhataārtha Kaumūdī, I १११

² विकूर्चकमिति त्रय कूर्चा यस्य तत् विकूर्चकम् तत्र तन्वान्तरम् —

अङ्गुलानि तथाष्टौ च शस्त्रं कार्यं चिकूर्चकम् ।

फलैरन्तर्मुखाकारेवङ्गुलैरन्वितं त्रिभिः ।

एकैकस्य फलस्यैषामन्तरं ब्रौह्मिस्मृतम् ।

वृन्तं पञ्चाङ्गुलाग्रम् कार्यं रुचकभूषितम् ॥

Nivandha Samgraha, I viii

³ स्थिरकठिनमण्डलानां स्विन्नानां प्रस्तरप्रणाडीभिः ।

कूर्चैर्विघट्टितानां रक्तोत्क्षेपशोऽपनेतव्यम् ॥

Caraka Samhitā, VI vii

othei, khaja The kūṇeca¹, he describes as an instrument "consisting of seven or eight rounded sharp needles, four anguli long, nicely bound together by a cord and tightly fixed on a circular wooden handle" He mentions its use in the operation of scratching to cure baldness and the brown and black spots on the face For scarifying a bald spot, Cakṛadatta² uses needles, rough leaves, etc "The khaja³," Vāgbhata continues, "consists of eight rounded needles having the sharp ends half an anguli long It is to be introduced

¹ कूर्चोद्धर्त्तक पीठस्था समष्टी वा सुवन्धना ।

सद्योज्य नीलिका लङ्घ केश गतेषु कुट्टने ॥

Astāṅga Hṛdaya Samhitā, I १११

सम्प्रति कूर्चाख्य शस्त्र लक्षयितुमाह सर्व्वत्यादि ताः सूच्य सर्व्वेष्व ब्रत्ताः वर्तुलाः तथा चतुरङ्गुला चतुरङ्गुलदीर्घाः कृच्च इत्युच्यन्ते । ता सूच्य पुन कौटुशा ? इत्तेकपीठस्था, इत्ते वर्तुले एकस्मिन् पृष्ठे सस्थिता, एक ब्रत्ताकार काष्ठफलक परिवेष्ट्य स्थिता इत्यर्थः । तथा सप्तसङ्ख्यका अष्टसङ्ख्यका वा, तथा शोभन रज्ज्वादिकृत बन्धनं यासा तास्तथाविधा, सुवन्धना । स कर्चः नीलिकादिषु रोगेषु कुट्टने कुट्टनार्थे सद्योज्य प्रयोज्य इत्यर्थः । कुट्टन आचूडान इति लोके । नीलिकादयो वक्ष्यमाणा केशशत, केशाना पतन ।

Vāgbhatārtha Kaumūdī, I १११

² अवगाढपदस्यैव पुच्छयित्वा पुन पुन ।

Cakṛadatta, Kṣudhāroga Cikitsā

अवगाढपदमिति गम्भीरपद यथास्यात् तथा सूचीनखरञ्जन्यादिभि पुच्छयित्वा ' * *

Tattva Candrikā, ibid

³ अर्द्धाङ्गुलसुखैर्ब्रत्तेरष्टभिः काटके खज ।

पाणिभ्या, मथ्यमाणेन घ्राणात्तेन हरेदसृक् ॥

Astāṅga Hṛdaya Samhitā, I १११

खजसङ्गकशस्त्रमाह अर्द्धाङ्गुलसुखैरित्यादि अर्द्धाङ्गुलप्रमाण सुख येषा ते अर्द्धाङ्गुलसुखा सौवर्द्धाङ्गुलसुखे, इत्ते, वर्तुले अष्टभिः अष्टसङ्ख्यकै, काटके कृत शस्त्र खज उच्यते । तेन खजाख्येन शस्त्रेण पाणिभ्या हस्ताभ्या मथ्यमाणेन आलोच्यमाणेन घ्राणात् नासिकाया, असृक्कृतं हरेत्, निर्हरेदित्यर्थः ।

Vāgbhatārtha Kaumūdī, I १११

into the nostrils and turned to and fro with both hands to bleed the nasal polypi ”

The Greeks and Romans used a similar instrument for identical purpose. It was called *katiádion*, measuring a blade of grass, and was used for opening abscesses of the womb and tonsils, drawing blood from the inside of the nose and perforating the foetal cranium.

In India, the practice of drawing blood from the nasal polypus by blades of grass is still in vogue, and Aretæus mentions it as a common mode of scarification in ancient Greece also¹. “On the next day we are to abstract blood from the inside of the nostrils, and for this purpose push into them the long instrument named *Katiádion*, or the one named *Touyne*, or in want of these we must take the thick quill of a goose, and having scraped the nervous part of it into teeth like a saw, we are to push it down the nostrils as far as the ethmoid cells, then shake it with both hands, so that the part may be scarified by its teeth. Thus we shall have a ready and copious flow of blood, for slender veins terminate there and the parts are soft and easily cut. The common people have many modes of scarification, by rougher herbs and dried leaves of the bay, which they introduce with the fingers and move strongly ” Paul² opens the vessels in the nostrils with the reed called *typha*.

14 KUTHĀRIKĀ

It is a small instrument shaped like an ave, so called from its resemblance to *kuthāra*, an ave which is still used in India

¹ Extant works of Aretæus, P. 460

² Paul, vol II Sec 15

for cutting wood¹. Vāgbhata says² that "the base of the blade is thicker and broader than the end and is fitted to a handle, seven and a half anguli long. The blade which is shaped like the tooth of a cow, has the width of one anguli." Bhoja describes the width of the blade to be a half anguli³. It is recommended to be used for puncturing vessels in the following manner⁴—"Hold the handle with the left hand and put the blade on the vessel resting on a bone. Raise the instrument a little upwards and then strike over the thick base of the blade with the downward strokes of the middle or index finger, when let go

¹ For figure of Kuthāra as used in Ancient India, see Pl. xvi in Ferguson's *Tree and Serpent Worship*.

² पृथु कुठारी गोदन्तसदृशाङ्गुलानना ।

तथोर्ध्वदण्डया विध्येदुपर्यस्था सिरा स्थिता ॥

Astānga Hṛdaya Samhitā, I १११

कुठारिका सञ्जक शम्भमाह पृथुरित्यादि कुठारी पृथु स्यात् । कुठारिका नामशस्त्रं पृथुः
न्यूलम्बनं स्यादित्यर्थः । तथा गोदन्तसदृशाङ्गुलानना गवा दन्त गोदन्त सत्सदृशं तुल्याकार
अङ्गुलानना आनन मुखं यस्या सा तथा विषया तथा कुठार्या ऊर्ध्वदण्डया अस्था
उपरिस्थिता सिरा विध्येत् । तदण्डं वामहस्तेनोन्नीकृत्य कुठार्यामुखं शिरोपरि संस्थाप्य
दक्षिणाङ्गुलतर्जनीभ्यां कुठारिकामुलकमभिहत्य सिरा विध्येत् ।

Vāgbhata's Kṛmudī, I १११

³ कुठारिकेति कुठारतुल्या कुठारिका—

कुठारिकाया व्रन्तं स्यात् सार्धसप्ताङ्गुलायत ।

फलमर्द्धाङ्गुलाग्राम गोदन्तसदृशं समम् ॥

Nirāṇḍha Saṃgraha, I viii

⁴ तथा मध्यमयाङ्गुल्या वैधीऽङ्गुष्ठं विमुक्तया ।

ताडयेदुत्थिता ज्ञात्वा स्पर्शदवाङ्गुष्ठं पीडनै ॥

कुठार्या सचवेन्मध्ये वामहस्तं गृहीतया ।

फलीद्वेषे सुनिष्कम्पं शिरा तद्वच्च मीचयेत् ॥

Astānga Hṛdaya Samhitā, I xxvii

forcibly from the under surface of the thumb" Cakradatta¹ also advises us to use it in a similar manner To open the veins in fleshy parts, Vāgbhata recommends the viṭhimukha knife, while the kuthārikā is advised to be used in venesection on bony structures²

Pālakāpya³ mentions the kuthāria and describes its shape to be like an axe It is to be used for excision and scarification He describes another śastra called vatsadanta (*lit*, the calf's tooth), it is ten anguli long, and the mouth of the instrument is one and a half anguli broad It is also to be used for excision

"Bleeding from the jugular vein, he (Albucasis) describes much in the same way that it is now practised by veterinary surgeons, namely, by placing a sort of scalpel bent at the point, which he calls fissorium, upon the vein, and striking the instrument with a hammer or some such body He gives drawings of variously shaped lancets for opening the veins of the arm"⁴

"Femurs bleed with a fleam, which, though apparently a clumsy method of operating, is certainly safer than the lancet in

¹ वामहस्तेन विन्यस्य कुठारीमितरेण तु ।

ताडयेन्मध्यमाङ्गुल्याङ्गुष्ठविष्टम्बसुक्तया ॥

Cakradatta Śiṅgavyādhādhikāra

² मासले निचिपेष्टे ऽं ग्रीहास्य ग्रीहिमावकम् ।

यवाङ्गमस्थ्वासुपरि शिरा विध्वन् कुठारिकाम् ॥

Aṣṭāṅga Hṛdaya Samhitā, I १११॥

³ कुठाराकृतिं कुर्यात् । कुठारी शस्त्रप्रच्छेदनार्थं । वत्सदन्ताकृतिं वत्सदन्तं दशाङ्गुलम् ।
एकेकमध्यङ्गुलमुखम् । एवमेतानि च वीक्ष्यपि यथायोगं प्रच्छेदयत् ।

* * * * *

कुठाराकृतिशस्त्रेण ततस्तु प्रच्छेदयिष्यत् ।

नातिगाढं न च लघुं न घनं विरलं न च ॥

Pālakāpya, III ॥

⁴ Albucasis Chirurg. ॥ 97, also see Adam's Commentary on Paul, VI 1x 323

unknown hands" "In bleeding with a fleam, the near side is most convenient In skilful hands, there is no occasion for a blood stick, as the fleam may be struck with the right hand if it is made broad and round at the back It also may be made much smaller and neater than that generally employed" There is a drawing of such an improved fleam which much resembles in appearance the kuthārī of the Hindus "A fleam is rather more convenient instrument in bleeding, either from the arm or thigh, as the vein is somewhat apt to roll when a lancet is used"¹

15. VRĪHIMUKHA.

It is described as a kind of trocar², the sharp end being pointed and shaped like a grain of paddy It is six anguli long, the handle being two and the blade four anguli (Bhoja) But Vāgbhata³ describes the length of the blade to be one and a half anguli

It is advised to be used for paracentesis abdominis in abdominal dropsy Suśruta says ⁴ 'The friends of the patient should

¹ White's Compendium of the Veterinary Art, 1851, 18th ed P 342

² ब्रीहिमुखमिति ब्रीहिमुखमिव मुखमस्य ब्रीहिमुखं तत्र भोज —

शस्त्रं ब्रीहिमुखं कार्यमङ्गुलानि षडायतम् ।

द्व्यङ्गुलं तस्य हन्तं स्यात् तत्फलं चतुरङ्गुलम् ।

तन्मुखं ब्रीहिविस्तारं तनुसंगुदकण्टकम् ॥

Nivandha Samgraha, I viii

³ * * * * * तथाध्यर्हाङ्गुलं फले ।

ब्रीहिवक्त्रं * * *

Astānga Hrdaya Samhitā, I xxvi,

⁴ उदकोदरिणस्तु वातहरतेलाभ्यक्तस्योदकस्त्रिषस्य स्थितस्याग्ने सुपरिगृहीतस्याक्चात्-
परिवेष्टितस्याधो नाभेर्वामतश्चतुरङ्गुलमपचाय रोमराज्या ब्रीहिमुखेनाङ्गुलीदरं प्रमाणमवगाढं
विध्यते ॥

Suśrutā Samhitā, IV xiv,

hold him under the axilla Then the abdomen is to be tapped by the viihimukha knife at a point, four anguli distant on the left side from the median line, underneath the navel" Vāgbhata¹ advises us to surround a broad bandage round the abdomen before tapping it by the instrument, which he recommends to be introduced up to one anguli Cakradatta² refers to works on surgery for the surgical treatment of ascites A small incision is directed to be made before the puncture

In the Aśvavaidyaka, for this operation, the utpalapatia knife is recommended, an incision four anguli long is directed to be made above or below the navel of the horse, and then the end of the knife is to be plunged into the abdominal cavity up to one anguli³ The viihimukha is also advised to be similarly used⁴

Hippocrates speaks of evacuating the fluid in paracentesis abdominis with an instrument which Campeı thinks must have been a kind of trocar⁵

- १ सजले जठरे तैलैरभ्यक्तस्यानिलापहै ।
 खिन्नस्रोणाम्बुना कचमुदरे परिवेष्टिते ॥
 वडहिद्रोदितोस्थाने विध्योदङ्गुलमात्रकम् ।
 निधाय तथिग्राहीञ्च स्वायेर्द्धमभ्रस ॥
 अथास्य नाडीमाह्वय तैलेन सवणेन च ।
 भ्रणमभ्यव्य वहा च वेष्टयेद् वाससीदरम् ॥

Astānga Hrdaya Samhitā, IV २२

- २ जात जात जल स्रायं शास्त्रोक्त शस्त्रकर्म च ।

Cakradatta, Udamacikitsā

³ See foot-note, 1 p 212

⁴ See foot-note 4 p 241

⁵ See the Commentary on Paul Br Adams, vol II, P 338

It is also to be used for puncturing the vessels in phlebotomy (Vāgbhata)¹ especially in the fleshy parts of the body.² Cakradatta uses viihimukha in phlebotomy and says "The sharp end of the viihimukha should be kept under the palm between the thumb and index finger and is to be thrust into the seat of puncture."³

Saśrūta directs us to use it in tapping the hydrocele.⁴ "Then the hydrocele is to be wrapped round with a bandage. The fluid is next to be drained by tapping it with a viihimukha on the lower part of the scrotum, little externally to the suture."⁵ Similar directions are given in the Yogiratnākara.⁶ Cakradatta also gives a similar description.⁷

¹ ब्रीहिवक्त्रं प्रयोज्यञ्च तत्सिरोदरयोर्वध्ये ।

Aṣṭāṅga Hṛdaya Samhitā I १११

ब्रीहिसुखाख्यं शस्त्रं आह ब्रीहिवक्त्रमित्यादि ब्रीह्वक्त्रमिव वक्त्रं यस्य ततः ब्रीहिवक्त्रं ।
ब्रीहिसुखं यत्शस्त्रं तत्सिरानां व्यधे व्यधने तथा उदरस्य जलोदरस्य व्यधे स्थावण्याय
योज्यम् ।

Vāgbhatārtha Kaumudī IV १११

ताडयन् पीडयेच्चैना विध्येद् ब्रीहिसुखेन तु ।

Aṣṭāṅga, Hṛdaya Samhitā, I १११

² मासले नि चिपेद्देशे ब्रीहास्य ब्रीहिमाचकम् ।

Ibid

मासलेष्ववकाशेषु यवमाषं शस्त्रं निदध्यादतो हन्येष्वयवमाषं ब्रीहिमात्रं वा
ब्रीहिसुखेन ।

Saśrūtā Samhitā IV viii

³ ततो ब्रीहिसुखं व्यध्यप्रदेशे न्यस्य पीडयेत् ।

अङ्गुष्ठतर्जनीभ्यास्तु तलप्रक्कादितं भिषक् ॥

Cakradatta Śirāvyādhādhikāra

⁴ See foot note 5 P 123

⁵ सस्वेद्यं सूत्रप्रभवं वस्त्रखण्डेन वेष्टयेत् ।

सीवण्या पाश्वतोऽधस्ताद्विध्येत् ब्रीहिसुखेण वै ॥

Yogarātnākara

⁶ सस्वेद्यं सूत्रप्रभवा वस्त्रपट्टेन वेष्टयेत् ।

सीवण्या पाश्वतोऽधस्ताद्विध्येत् ब्रीहिसुखेण वै ॥

Cakradatta Vīddhī Cikitsā

Paul describes the operation but he recommends a sharp-pointed knife or lancet instead of a trocar. He says "Wherefore we must make the patient stand erect, or if this can not be done, we must cause him to be seated, * * * We give orders to the assistants standing behind to press with their hands and push downwards the swelling to the pubes. Then taking a sharp-pointed knife or lancet, if dropsy be among the intestines, in the perpendicular line of the navel, and about three fingers' breadth distance from it we divide the hypogastrium as far as the peritoneum"¹ Celsus mentions that some perform it at a spot four fingers' breadth below the navel in the left side, and recommends us to use a perforator, the point of which should be about the size of the third part of a fingers' breadth.² Vegetius, the veterinary surgeon, recommends paracentesis for the dropsy of cattle.³ The Arabic authors Avicenna,⁴ Serapion,⁵ Albucasis,⁶ Haly Abbas,⁷ and Rhazes,⁸ give similar descriptions.

In modern times, we perform the operation in the same way "It is necessary in certain conditions to tap the abdomen in order to withdraw fluid which has accumulated there and this is usually done by means of a special trocar and canula. The site for tapping is selected, the usual spot being in the middle line, half-way between the umbilicus and the pubes. A

¹ Paulus Ægineta, Bk VI 1 Syd Soc Ed

² Celsus vii 15, ii 10

³ Vegetius Mulom iii 25

⁴ Avicenna, iii 14, iv 13

⁵ Serapion iv 7

⁶ Albucasis Chirrug ii 54

⁷ Haly Abbas, Pract ix 41

⁸ Rhazes, Cont xix.

small puncture about one-third of an inch long is made with the knife at the spot selected. The trocar and canula to which the rubber tubing is attached, are then thrust through the abdominal wall into the peritoneal cavity."¹

The Greeks did not describe the operation of tapping the hydrocele. They always preferred the open incision to puncture. Paul uses a knife for making the skin incision, but when the tunica vaginalis is laid bare, he divides it through the middle with a lancet for bleeding.² Some of the Arab authors mention the operation of puncturing the scrotum for hydrocele. If the patient be timid, and do not choose to submit to open incisions, Albucasis advises the surgeon to let out the water either with a scalpel or the instrument used for tapping in dropsy. He states, however, that the water will collect again after this operation.³ Rhases also describes this operation.⁴

In modern times, trapping for hydrocele is still practised. "When trapping a hydrocele the patient should be sitting up in a chair * * *. The scrotum, having been cleansed, is grasped from behind by the left hand * * *. A spot, free from any large veins, is selected on the anterior and lower part of the swelling, and the trocar and canula introduced with sharp stabbing movement."⁵

Pālakāpya⁶ describes viñhumukha as shaped like a gram of paddy and recommends it for scission and excision of muñja

¹ Operations of General Practice By Corner and Pinches P. 109, 2nd ed.

² Paulus Aegineta, VI. lxii.

³ Albucasis Chrug. ii. 62.

⁴ Rhases. Cont. xxix.

⁵ Operations of General Practice, P. 145.

⁶ 'सवणं पाटनं चैव कुर्यात्पिस्त्रिमुखेण तु।

16. ĀRĀ OR AWL

It is a long sharp needle in handle, so called from its resemblance to the shoe-maker's instrument known as awl "It has a total length of sixteen anguli, with a sharp end of the size of a sesamum seed The handle is tapering like a cow's tail and is equal in circumference to the young stem of *Dūrvā* (*Unodon Dactylon*)" (Bhoja)¹ *Suśruta* mentions its length to be six anguli *Vāgbhata* describes the length to be one anguli, the basal half being round, and the terminal half, four cornered and sharp pointed The terminal part is introduced into the inflammatory swellings to confirm the diagnosis of suppuration It is also to be used to drain the congested blood vessels in the matrix of the nails as a result of traumatism²

- ¹ आरिति, आरिव आरा असि चर्म्मकाराणां शस्त्रं । तव तन्वान्तरम् —
आरा इष्टाङ्गुलयासा कर्म्मव्या तु विशास्यते ।
तिलप्रमाणान्तु फलं तस्या कार्यं समाहितं ।
दुर्व्वाङ्गुरपरीणाहं हन्त गोपुच्छसन्निभं ।

Nivandha Samgraha, I viii

- ² व्यधने कर्णपालीना युथिका मुकुलानना ।
आराङ्गाङ्गुलं वृत्तास्य ततप्रवेशो तथोद्धृतः ॥
चतुरस्रा तथा विध्येच्छेद्यः पक्वाम सशये ।
कर्णपालीश्च वहला वहलाया न च शस्यते ॥
सूत्रा विभागयथिरा षडङ्गुला कर्णवेधनी ।

Aṣṭāṅga Hīdya Samhitā I 121

सम्प्रति कर्णपालि व्यधने योग्यानि शस्त्राणि वक्तुमाह व्यधने इत्यादि कर्णपालीना कर्णलताना व्यधने व्यधनविषये युथिका युथिका नाम शस्त्रं योग्यं । कीदृशी ? मुकुलानना मुकुलवत् प्रकृतत्वात् युथिका मुकुलवत् आननं मुखं यस्या सा तथाविधा । आरित्यादि अर्द्धाङ्गुल परिमाणं वृत्तं वर्तुलं आस्य मुखं यस्या सा तथा अर्द्धाङ्गुलवृत्ताया, तथा स एव अर्द्धाङ्गुलप्रमाणं प्रवेशं प्रवेशनं यस्या सा तथाविधा तत् प्रवेशं तथा ऊर्द्धं तत् वृत्ताङ्गुलादुपरिष्ठात तथा अर्द्धाङ्गुल परिमाणेन चतुरस्रा चतुष्कोणा सा आरा कथ्यते ।

It is also said to have been used for perforating a thick lobule of the ear, though for this purpose another instrument called *karna-vadhānī* or ear-perforator—a needle specially meant for perforating the lobules of the ears,—is mentioned. It is three anguli long, having a slit or eye in the three-fourths of its length. The barbers used a similar needle to perforate the ears on the ceremony of tonsure.

For piercing the lobule of the ear, another instrument is mentioned. It is called *jūthikā*, from its end resembling in shape the conical bud of *jūthikā* flower (*Jasminum Amiculatum*).

Suśruta uses *śrī* or *pīṇmantha* to perforate the bone in diseases of the medullary canal caused by the obstructed and deranged air¹. He next introduces one end of a tube open at

एतेन श्वाय्या फलं एकाङ्गुलपरिमितमिति फलति तत्र प्रथमाङ्गुलं हृत्तमपराङ्गुलं चतुरस्रं तथोरभयभागयोर्मध्ये अयस्ययतुरस्ती भाग प्रवेशयोग्य इति सूचितं । तथा श्वाय्या पक्ष्मा संग्रहे अथ शोथ पक्ष्मा मोवेति सङ्ग्रे सति तादृश शोथ विधेयं, तथा वहला अतिसामाना कर्णपालीच तथा विधेयमिति योज्य । वहलामित्यन्तेन श्लेद । वहलाया-मित्यादि वहनाया अतिसामानाया कर्णपाल्या व्यधने कर्णवेधनी नाडी सूची च शस्यते । कीदृशी ? विभागशुषिरा, विभाग शुषिरं गन्धं यस्याः सा तथाविधा विभागशुषिरा तथा तद्गन्धा अङ्गुलवयदीर्घा । न केवलमारा वहलाया कर्णपाल्या व्यधने शस्यते अपि तु कर्णवेधनी नाडी सूची च शस्यते इत्यर्थः । कर्णवेधनी सूची अमरदेशीया नरसुन्दरा कर्णवेधनार्थं व्यवहरन्ति । अतोंऽप घातुल्यवर्णयेति ।

Vāgbhatārtha Kaumūdī I १११

¹ निरुद्धेऽस्थिनि वा वायी पाणिमन्येन दारिते ।

नाडीं दत्तास्थिनि भिषक् चुपयेत् पवनवली ॥

Suśruta Samhitā IV १४

निरुद्धे इत्यादि । त्वडमांसं शस्त्रेण विपाद्य अस्थि पाणिमन्येन अराशस्त्रेण विद्धा तत्र रग्ने दिमुखी नाडी प्रणिधाय सुखमारुतं चुपणेन लवनापकर्षणं करणीयमिति ।

Nivandha Samgraha IV १४,

both ends into the canal through the hole in the bone, while through the other end the surgeon sucks out the air by his mouth

For perforating the ears of the elephants, a similar needle is recommended by Pālakāpya. It is known as *karmāṇa* or *nālī*.

17 VETASAPATRAKA

It is a long sharp cutting instrument shaped like the leaf of the rattan (*Calamus Rotang*). Its edge is finely serrated and very sharp. The blade and handle are equal in length, measuring four *angulī*. Bhoja says "The blade is one *angulī* wide"¹. It is said to have been used for puncturing vessels in phlebotomy².

18 VADISĀ OR SHARP HOOK

In shape it is described to resemble the ordinary fish-hook. Bhoja describes the total length to be six *angulī*, its hook being half an *angulī* and its handle five and a half *angulī* long. The end is bent, the curvature varies and may be shaped like a half-moon³.

¹ वेतसपत्रमिति, वेतसपत्रमिव वेतसपत्रमव भोज —

तीक्ष्णमङ्गलं विस्तारं चतुरङ्गुलायतम् ।

अङ्गुलानि तु चत्वारि वृत्तं कार्यं विज्ञानता ॥

Nivandha Samgraha, I १०११

² वेतस व्यधने ।

Astāṅga Hīdaya Samhitā, I ११११

वेतसपत्रादि शस्त्रमाह वेतसमित्यादि वेतस' वेतसपत्र' नामशस्त्रं सिरादीना व्यधनं कर्मणि-
घोच्य' । वेतसपत्रवद्वन्तुरत्वास्य वेतस' वेतसपत्र' वेत्ति सज्ञा ।

Vṛgbhatārtha Kaumūdī, I ११११

³ वडिशमिति वडिशतुल्य' वडिश मत्स्यवेधनीमाह । तत्र तन्वान्तर —

वडिशे चापि कर्तव्ये प्रमाणे तु षडङ्गुले ।

स्नानतन्तु तयोरेकमेकं नात्यायतं भवेत् ।

Suśruta says¹ The end of the hook is sharply edged and is said to have resembled the new leaf of Java (*Hordeum vulgare*)

It is recommended by Suśruta² to be used for extraction of foreign bodies, *e.g.*, the extraction of stone from the urethra. Its use is also mentioned for transfixing the membranous expansion in the operation for pterygium³ and for fixing and dragging the uvula and tonsil before the performance of any operation on these parts⁴. Cakradatta⁵ mentions its use for fixing a growth, before its excision by the knife

अर्द्धापञ्चाङ्गुलं बन्तं शेषं कार्यं सुखं तयो ।

अर्द्धचन्द्राकृतिं वक्त्रं कार्यं नात्यन्तसमं तु ।

स्नानतः नामयेत् तव वडिशश्चभिषग्वर ।

बन्ताययोरन्तरं स्याद् यावदर्द्धाङ्गुलं मतः ।

Nivandha Samgraha, I viii

¹ वडिशोदन्तशङ्कुश्चानताग्रे तीक्ष्णकण्टकं प्रथमयवपत्रसुखे ।

Suśruta Samhitā, I, viii

² यदृच्छया वा मुचमार्गप्रतिपन्नामन्तरासक्ता शक्राश्मरी शर्करा वा स्रोतसा अपहरेत् एव चाशक्वे विदार्थ्य वा नाडी शस्त्रेण वडिशेनोद्धरेत् ।

Suśrutā Samhitā, IV vii

³ ग्रहणेश्चुण्डिकार्मादेर्वडिशं सुनताननं ॥

Astānga Hrdaya Samhitā, I xxvi

वडिशशस्त्रमाह ग्रहणे इत्यादि सुष्ठु नतं अङ्गुश्वतं नसक्तं आननं सुखं यस्य स तथाविधं सुनताननं वडिशं मत्स्यवेधनवत् वडिशोनामं शस्त्रं स्यात् । स च शुण्डिकार्मादेर्ग्रहणे योज्यः । आदिपदेण उपजिह्विकादि परिग्रहः ।

Vāgbhatāṭha Kaumūdī, I xxvi

⁴ पिडकामुत्तमाख्याञ्च वडिशेनोदरेक्षिपक् ।

उद्धृत्य मधुमयुक्तैः कषायैरवचूर्णयेत् ॥

Suśruta Samhitā, IV xvi

⁵ उत्तमाख्यान्तुपिडका सक्रियं वडिशोद्धृताम् ।

Cakradatta, Śukradoṣa Cikitsā

It was also used for fixing any growth in the eye, previous to its excision by the mandalāgia¹ For this purpose the Greeks used the vulsellum (myzon) Aetius says "If there is a large and malignant excrescence in the angle of the orbit, the enlarged part must be seized with vulsella and cut off"²

Evidently vadisa was used on many occasions when in modern times we use the dissection forceps to steady a part before excision

Vadisa is described in the Aśvavaidyaka³ to have been similarly used during the operation of pterygium in horses

Pālakāpya⁴ mentions vadisa which is described as eight anguli long, the end being rounded like a wheel It is to be used for raising the membranes of the eye globe

Sharp hooks were used by the Greeks and Romans, for similar purposes The use of the sharp hook for fixing the pterygium is mentioned by Celsus⁵, Aetius⁶, Paul⁷ and Albucasis⁸

Its use in the excision of the tonsil is mentioned by Paul⁹ After the patient being placed in the proper position, he narrates "We take a hook (tenaculum) and perforate the

¹ See foot notes 1, 2 and 3, P 227

² Aetius vi 74

³ चितौ निपात्य तुरगं ततोऽत्र प्रसारयेत् ।

कृतकर्मा भिषग्विद्वान् वडिशिनाच्चिवत्सर्जनि ॥

Aśvavaidyaka, XXX v 32

⁴ वडिशं चक्रायमष्टाङ्गुलप्रमाणमज्जो पटलोद्धरणार्थं चेति ।

Pālakāpya, III xxx

⁵ Celsus VII vii

⁶ Aetius Tet ii, iii, 60

⁷ Paul VI xviii

⁸ Albucasis Chirurg ii, 16

⁹ Paul VI. xxx

tonsil with it, and drag it outwards as much as we can without drawing its membranes along with it, and then we cut it out by the root with the scalpel suited to the hand, called aneylotomus, for there are two such instruments, having opposite characters”

19 DANTA ŚANKI OR TOOTH-SCALER

Its head is half an anguli long. It is quadrangular in shape and has a sharp edge. Susruta¹ describes the end as slightly bent, sharp and shaped like the fresh leaf of Java. Bhoja² describes the end to be like that of the vṛihumukha

Vṛghat³ describes a similar instrument called dantalekhana or tooth-scaler. It is also quadrangular in shape, one side being sharp-edged and the opposite side little lengthened. It is

¹ See foot note 1 P. 265

² एव हि क्रियते एतौ दण्डशङ्कुर्विज्ञानता ।
 शङ्कु वच्च सुखं तस्य कार्यमशङ्कुलायतम् ॥
 चतुरस्र समखेव तीक्ष्णधार समाहित ।
 वृषाय तस्य कर्तव्यं शस्त्रं व्रीहिमुखीकृति ।
 कपालिका शर्कराश्च दन्तस्थानेन शोधयेत् ॥

Nivandha Saṃgraha, I viii

³ एकधार चतुष्कोण प्रवृद्धाकृति चेकत ।
 दन्तलेखनक तेन शोधयेदन्तशर्करान् ॥

Aṣṭīṅga Hidaṇḍa Saṃhitā, I १११

दन्तलेखनं शस्त्रमाह एक धारमित्यादि एका धारा यस्य तत् एकधार चत्वार कोणा यस्य तत् चतुष्कोण कोण, कोणा इति यस्य प्रसिद्धिः तथा एकत एकदेशात् प्रवृद्धा वर्धनशीला आकृति आकारो यस्य तत्तथाविधं प्रवृद्धाकृति दन्तलेखनं दन्तलेखनाख्यं शस्त्रं स्यात् तेन दन्तलेखनाख्येन शस्त्रेण दन्तशर्करान् दन्तनिवहान् शर्कराख्यानं लेखयेत् कर्शयेदित्यर्थः । दन्ताल्लिख्यन्ते अनेनेति दन्तलेखनं दन्तशर्करा पाथरि इति लोके ।

Vṛghatvṛthā Kaumūdī, I १११

recommended to be used for the extraction of sores and tartar from the teeth ¹

The procedure of the operation of tooth-extraction is not described in detail in the medical books of the Hindus. But the operation seems to have been well known, for Suśruta distinctly advises the students to practise the operation of extraction on the fruits of Panas (*Atiocarpus Integrifolia*), Vimbī (*Cephalandia Indica*), Vilva (*Ægle Marmelos*) and on the teeth of the dead animals ². He also advises us to extract the wisdom teeth and to apply cauterly to their sockets ³. Also when a tooth becomes loose he directs us to extract it and apply cauterly to the socket ⁴. In the treatment of sinus caused by carious tooth, he advises us to extract the tooth, otherwise the sinus would extend down to the inferior maxillary bone ⁵.

¹ शस्त्रेण दन्तवैदर्भं दन्तमूलानि शोधयेत् ।

८ * † ‡

अहिंसन् दन्तमूलानि शर्करासुद्धरेद् भिषक् ।

Suśruta Samhitā, IV १५१

² See foot note 2 P 280

³ उद्धृत्याधिकदन्तान् ततोऽग्निमवचारयेत् ।

कृमिदन्तक-वशापि विधिः कार्यो विज्ञानता ॥

Suśruta Samhitā, IV १५५,

⁴ चलसुद्धृत्य च स्थानं विदहेच्छुधिरस्य च ।

Ibid

⁵ यन्दन्तमधिजायेत नाडी तदन्तसुद्धरेत् ।

कृत्वा मांसानि शस्त्रेण यदि नोपरिजीभवेत् ॥

शोधयित्वा दहेद्वापि चारेण ज्वलनेन वा ।

भिनश्युपेक्षिते दन्ते हनुकास्थि गतिशुभ ॥

समूलं दशनं तस्मादुद्धरेद् भग्नमस्थि च ॥

उद्धृतेतूत्तरे दन्ते मण्डले स्थिरवन्धने ॥

Ibid

Pālikāpya¹ mentions the extraction of tooth of the elephant by means of entpadi which is an iron bar, thirty-two anguli long and equal to the tooth in circumference.

Paul says: "The limber which unite to them (the teeth) we may remove as may appear proper, with the concave part of a specillum, a raspator, or a file." The operation of tooth-extraction was however, not liked by the ancient Greeks as cases in which the operation proved fatal, occurred in their practice. Celsus, Aulus Cornelius Celsus, Herophilus, and Galen disapprove in general of the operation except in extreme cases.

It would no doubt, be interesting to know that in ancient India the Hindus knew how to make false teeth to be used by men who have lost them either by accident or by extraction by the dentists. In 1191 A.D., Suhubuddhi defeated Jayacandira in battle "and the incident of the body of the rāja being recognised by his false teeth"—a circumstance which throws some light on the state of manners" is well known.

20. DASTI OR SHARP PROBES

"The probes", says Cuiuka², "are of two kinds, the hard or

¹ द्वाविंशदङ्गुलपतदशनपरिनाहिनं लाङ्गदण्डेन ।

एनीपदेन कुर्यादङ्गुलं तयो मयम् ॥

² श्रीरामायणे च परिग्रोध्य सर्व्वमासा दन्तमूलेषु ।

उत्थोदकधीतेषु मधुमर्पि पूरणं दद्यात् ॥

Pālikāpya, III xxviii

³ Paul VI xxviii

⁴ Elphinstone's History of India, P. 365, 5th Ed.

⁵ द्विविधानपणा विद्यान्मधीस कटिनामपि ।

उद्भिदैर्दन्तभिर्नालमोक्षिणा वा शलाकया ॥

गम्भीरमासने देशे पार्श्वे श्रीरामायणे ।

पण्य विद्याद व्रण नालेविपरीतमती भिषक् ॥

Cuiuka Samhitā, VI xiii,

metallic probes, and the soft probes such as the young stems of plants. The hard probes are required for deep sinuses in the fleshy parts and the sides of the body, while the softer varieties are used for probing the superficial sinuses". The ends of the probes are generally shaped like the head of the earth-worms¹ Suśruta² describes them to be eight anguli long. They are to be used as probes to ascertain the direction of sinuses³. The blunt probes have been described before under the śalākās⁴.

The sharp probes have the shape of a needle and are six anguli long. The other end carries an eye through which is put one end of a caustic thread (i.e., thread soaked in caustic lotion and then dried). The probe is to be used for piercing the tissues through the blind end of the sinus. The end of the thread is next to be withdrawn from the eye of the probe and a tight knot applied with the other end. The intervening bridge of tissues is thus gradually cut and the sinus opened. If the cord be found inefficient for the purpose, a second thread is to be tied similarly.⁵

¹ एषणी गग्गुपदाकारमुखी ।

Susruta Samhitā, I viii

² तत्र नखशस्त्रं पण्णावष्टाङ्गले ।

Ibid

³ गतेरन्विषये श्लक्षा गग्गुपदमुखेषणी ।

Astāṅga Hṛdya Samhitā, I १११

एषाण्यस्य शस्त्रमाह गतेरित्यादि एषणीनाम शस्त्रं गति नाडीव्रणस्य पूयादिपथस्य अन्विषये अन्ववेष्टये योज्यं । सा चैषणी श्लक्षा कीमलस्पर्शा, तथा गग्गुपदमुखा, सङ्कीलता मुखाकार मुखा च भवति ।

Vāgbhatārtha Kaumūdī, I १११

⁴ See page 155 7

⁵ क्लृप्तदुर्बलमीरुणा नाडीमग्नेयिताश्च या ।

चारसूत्रेण ता हिन्द्यान् तु शस्त्रेण वृत्तिमान् ॥

This method of treatment is recommended for the weak and timid patients. The needle-shaped probe is also to be used in the extirpation of new growths by means of caustic threads. Cakradatta¹ also describes this operation evidently he copies it from Susruta. In the *Yogarātnākara*² the verses describing the operation are also quoted. Vāgbhata also mentions a needle-shaped probe for the same purpose.³

In treating of fistula-in-ano, Paul quotes from Hippocrates and says⁴ —“For Hippocrates directs us to pass a raw thread,

पथस्य गतिमन्विष्य चारुमृदानुसारिणीम् ।
 मृदो निरञ्जान्मृदे सद्योऽप्यस्य निररेत् ॥
 मृदुमृदानां मृदानीय मृदवस्य समाररेत् ।
 तत एव च धीत्य मृदमन्यत् प्रररेत् ॥
 चारुस्य गतिमान् मृदो यावन्नृच्छिगते गति ।
 भगन्दरे, ष्ये प तिधि काथ वैगेन जानता ॥
 चक्षुःश्रोत्रे चोत्पिष्य मृदे मृच निधापयेत् ।
 मृचोभिर्यावत्कालमिवाचितं वा समन्तत ।
 मृदे मृदेण वधीयाश्चिन्ने क्षोपचरेण ॥

Susruta Samhitā, IV ५५५

¹ These verses are quoted in the Cakradatta. Nādirāna Cit itā

Also quoted in the Yogarātnākara P. 316

² भेदनायैऽपरा मृचोऽसृता मृलनिविष्टत्वा ।

Arbūṅka Hidaya Samhitā, I ५५५

अपरमत्रेपणी शस्त्रमाह । भेदनार्थं इत्यादि भेदनाथे नाडीव्रणानां गतिभेदनथ अपरा पूर्वोक्ताया उपर्या अस्या मृचोऽसृता मृचाकारं सृता मृत् तथा मृले मूलदेशे निविष्ट, मृलनिवेश योग्य एव छिद्रं यस्या सा मृलनिविष्टत्वा सच्छिद्रमृलमित्यर्थः । अस्या एषामूलं छिद्रकरणं चारुमृदनिवस्यनार्थः । तेन अभिन्नं क्षारनिष्काशिनेन दृढवस्त्रेण चारुमृदेण नाडीव्रणं प्रकाश्यते ।

Vāgbhātātha Kaumūdī, I ५५५

⁴ Paul VI ५५५५.

consisting of five pieces, through the fistula by means of a probe having a perforation, or a double headed specillum, and to tie the ends of the thread and tighten it every day until the whole intermediate substance between the orifices be divided and the ligature fall out" Hippocrates ¹ describes minutely the apolinose and recommends it for those who from timidity avoid a surgical operation Celsus recommends the thread to be smeared with some escharotic ointment The process, he says, is slow but free from pain² Albucasis ³ also approves of the operation according to circumstances The operation called apolinose *re*, by the ligature, is very celebrated Ambrose Pare, Foubert, Camper, Guido de Cauliaco and Rogerius approve of the ligature It has been recommended by some of the modern surgeons⁴ The operation is still practised in India by the Madras specialists for fistula-in-ano

Vāgbhata ⁵ describes copper probes having the sharp ends shaped like the buds of *Kuavaka* (*Baleria Cristata*) to be used in

¹ Hippocrates 'De Fistulis'

² Celsus vii 4

³ Albucasis Chirurg ii 80

⁴ Linct vol 1 1845, new series

१ ताम्बी शलाका द्विसुखा मुखे कुरवकाकृति ।

निम्न नाश तथा विध्यैत् ॥

Astāngar Hydaya Samhitā I १११

शलाका शब्द अहुलि शब्दश्चाह ताम्बीत्यादि द्विसुखा, द्विद्वारा, मुखे, मुखप्रदेशे कुरवका कृति, रक्तभिण्डीपुष्प मुकुलकारा, ताम्बी, ताम्रमयी, शलाका, शलाका शब्द स्यात् । तत्र शलाकया निम्ननाश, कफोत्थ पटल सन्नक चक्षुरोग विषय विध्यैत् । विध्यैदित्यनेन चेद. ।

Vāgbhatārtha Kramūddi I १११

the operation of cataract. Suśruta¹ describes such a probe to be eight anguli long, made of copper, or iron, or gold, the ends being shaped like buds. A thread is spirally twisted round the middle of the instrument for a length of a thumb's breadth, to afford a firm grasp by the surgeon's fingers. This instrument must not be rough, thick or very sharp, for then there would be a greater chance of the eye being injured more than is necessary and at many places. So also in couching of cataract, Celsus says: "Then a needle is to be applied, sharp so as to penetrate, but not too fine."

Pālakīpya² mentions esuri in the surgical treatment of diseases of the elephants. He describes three probes,—smooth and shaped like the collyrium rods. They are recommended to be ten, twenty and thirty anguli long respectively.

- ¹ शलाका कर्षशाग्रं गवरा दीपपरिप्लुतिं ।
 मय विज्ञानं मृगानां तोषां रिशदनेकधा ॥
 जलासायन्तु विपमा क्रियासद्गमधाम्बिरा ।
 करोति यजिता दीपेन्मयादभिरिता भवेत् ॥
 पट्टाङ्गुलायता मध्ये गुलेण परिवर्चिता ।
 पट्टुच पर्यसमिता वक्रयोर्भुङ्कुला कृति ॥
 तासायसी शतकीर्णो शलाका सशदनिन्दिता ।

Suśruta Samhitā, VI २४॥

² Celsus VII २४॥

- ¹ म्बिरा सृष्टी च कर्षस्या व्रणानामेपणी भवेत् ।
 वृत्ता गण्डुपदसुखी प्रमाणे विशदाङ्गुली ॥
 सुवर्णदण्ड्यतामाणासायसी शङ्खाऽपि वा ।
 दन्ताम्यवेनुदारुणासेपणी दारुणा भवेत् ॥

Pālakīpya, III १

एपणी दशाङ्गुला विशदङ्गुला विशदङ्गुला यथायोगमञ्जनशलाकाकृतिं सुखतः श्लेष्णा समा
 चैवमेतास्त्रिष्वप्यग्न्य प्रमाणतः कार्य्याः ।

Ibid, III २२२

The operation of couching for cataract is essentially an Indian operation, and Suśruta describes the operation minutely as follows —

The operation of couching for cataract

Suśruta says¹ “Now we shall describe the treatment of cataract caused by phlegm. If inside the crystalline lens, anything is seen like a half-moon-shaped drop of water or pearl, hard, irregular

८ श्लैष्मिके लिङ्गनाशे तु कर्म वक्ष्यामि सिद्धये ।
 नचेदङ्गैर्दुर्धर्मास्तु विन्दुमुक्ताकृतिः स्थिरः ॥
 विषमो वा तनुर्मध्ये राजिमान्वा बहुप्रभः ।
 दृष्टिस्थो लघ्वने दोषः सरुजा वा सुलोहितः ॥
 क्षिग्धस्त्रिन्नस्य तस्याथ काले नात्युष्णशीतले ।
 यन्त्रितर्योपविष्टस्य स्वान्नासा पश्यत समः ॥
 मतिमान् शुक्रभागी ह्यै कृष्णामृत्ताद्यपाङ्गतः ।
 उन्मोह्य नयने सम्यक् शिराजालं विवर्जिते ॥
 नाधो नोऽङ्घ्रि पार्श्वभाक् क्षिप्त्रे देवकृते ततः ।
 शलाकया प्रयत्नेन विश्वस्तं यववक्त्रया ॥
 मध्यं प्रदेशिन्यङ्गुष्ठस्थिरहस्तं गृहीतया ।
 दक्षिणेन भिषक् सव्यं विध्येत् सव्येन चैतरत् ॥
 वारिविन्द्वागमं सम्यक् भवेच्छब्दस्तथा व्यधे ।
 ससिच्यं विद्धमावन्तु योषितस्तन्येन कोविदः ॥
 स्थिरे दोषे चले वापि स्वेदयेदक्षिं वाह्यतः ।
 सम्यक् शलाका सस्याप्याभ्यङ्गैर निलानाशनैः ॥
 शलाकायेण तु ततो निर्झिखिहृष्टिमण्डलः ।
 विध्यतो योऽन्यं पार्श्वं ऽष्टाक्षं रुद्धा नासिकापुटः ॥
 उच्छिद्मनेन हतं व्यो दृष्टिमण्डलजं कफः ।
 निरुद्धं इव घर्माश्रय्यं दा दृष्टिं प्रकाशते ॥
 तदासौ लिखिता सम्यग् ज्ञेया याचापि निर्व्यथा ।
 ततो दृष्टेषु रूपेषु शलाकामाहरेच्छनैः ॥

or thin, started or shunning, painful or red, caused by the deranged humours, the oleaginous applications and fomentations are to be tried first at a time when it is neither hot nor cold, then the (patient) is to be ligatured after having him seated conveniently, and should be directed to look towards his own nose. The intelligent (surgeon), then separating the white part from the black part and the external canthus of the eye after opening it, avoiding the vascular network, and leaving the parts above and below intact, is to pass a *vāṇmukhī śulākā* (or sharp needle having its end resembling a wheat) through a natural opening on the side steadily holding the rod with the thumb, index and middle fingers. If the operation be required on the right eye, the left hand, and if on the left eye, the right hand of the surgeon should use the needle in puncturing. A successful puncture is known by the escape of a drop of fluid and an audible sound. The experienced surgeon is to sprinkle woman's milk just after the puncture, and keeping the needle there, whether the deranged humour be movable or not, should apply fomentations externally by means of oily remedies for the deranged air. The crystalline lens is next to be scarified by the sharp end of the needle. Then keeping the needle fixed in the side of the eye, the patient should be directed to sniff so as to destroy the phlegm of the lens. The proper scarification will be indicated when the lens appears brilliant as the sun uncovered by clouds. Then the vision being clear, the needle in the side of the eye, is to be removed, and the eye is to be well

घृतेनाभ्यज्य नयन पद्मपट्टेन वेष्टयेत् ।

ततो रक्ते निग्राधे शयीतोत्तान एव च ॥

soaked with ghee (melted butter) and bandaged properly” Vāgbhata also describes the operation similarly ¹

To this we may compare the account of the operation as given by Celsus. He “lays it down as a rule, that when the suffusion is small, immovable, and of the colour of sea water, or of shining iron, and if a small degree of light can be perceived at the side, there is reason to hope well of the case. He forbids us to operate until the disease has attained a proper consistence. He directs us to place the patient opposite the operator, who is to sit on a higher seat, while the patient’s head

- ¹ अथ साधारणे काले गुह्यसंभोजितात्मन ।
 देशे प्रकाशे पूर्ष्वाङ्गे भिषग्जानुञ्च पीठग ॥
 यान्वितस्योपविष्टस्य स्त्रिन्नाचस्य मुखानिलै ।
 अङ्गुष्ठं सृद्धिं नेत्रे दृष्टौ दृष्टोत्पन्नं मलम् ॥
 खनासा प्रोक्षमाणस्य निष्काम्य मुर्ध्नि धारिति ।
 कृष्णादर्क्षाङ्गुलं मुक्ता तदर्द्धार्द्धमपाहृत ॥
 तर्जनीमध्यमाङ्गुष्ठे शलाका निश्चलं धृताम् ।
 दैवच्छिद्रं नयेत् पाश्चाद्दर्शमामस्थयन्निव ॥
 सव्यं दक्षिणहस्तेन नेत्रं सव्येन चैतरत् ।
 विध्येत् सुविद्धे शब्दे स्यादरुक् चाम्बुलवस्तुति ॥
 सान्त्वयन्नातुरं चानु नेत्रं स्तन्येन सेचयेत् ।
 शलाकायास्ततोऽग्रेण निर्लिखेन्नेत्रमण्डलम् ॥
 अवाधमानं शमकैर्नासां प्रतिनुदस्ततः ।
 उच्छिन्ननासापहरेद् दृष्टिमण्डलगं कफम् ।
 स्थिरे दोषे चले चापि स्वेदयेदक्षिवाहृत ॥
 अथ दृष्टेषु रूपेषु शलाकामाहरेच्छनैः ।
 घृताप्लुतं पितुं दत्त्वा वद्धाच्च शाययेत्ततः ॥
 विद्वादन्येन पार्श्वेन तमुत्थानं हयोर्व्यधे ।
 निवाते शयनेऽभ्यक्तशिरः पादं हितेरतम् ॥

is held by an assistant. The sound eye is to be previously covered up with wool. If the left eye is affected, the operator must use his right hand, and *vice versa*. A needle which is sharp and not too slender is to be passed direct through the two coats at a place intermediate between the temporal angle and the back of the eye, and towards the middle of the cataract. When the needle has perforated far enough, which is readily known by the absence of resistance, it is to be turned so as gradually to remove the cataract below the region of the pupil and this object being attained it is to be strongly pressed to the lower part. If it remain there the operation is completed, but if it return, it is to be cut and torn by the needle into many pieces, in which state they are easier depressed, and prove less troublesome. The needle is then to be drawn out direct and soft wool smeared with white of an egg, and other anti-inflammatory applications are to be used. Quiet, restricted diet, and soothing treatment will be proper.¹ Paul², Mesue³, Albucasis⁴, Rhazes⁵ and others also describe the operation of couching in similar terms. Albucasis gives figures of these needles.

The operation is still practised in India by the māls who consider themselves specialists in diseases of the eyes.

21 ŚARPĀŚĪA

Vāgbhata describes an instrument having its end resembling

¹ Celsus vi. See Adam's Commentary to Paul VI. 111.

² Paul VI. 111.

³ Mesue Do Aegr. oculi, 15.

⁴ Albucasis Chirrug, II. 23.

⁵ Rhazes Ad mancos.

the mouth of a snake ¹ The blade is said to be half an angul long It is advised to be used for excision of the nasal and anal polyp

The fact that it was able to work inside the nose and the auditory canal shows that it could not have been of any great breadth, possibly less than a quarter of an inch at the most The exact shape of the saipāsya can not be determined with certainty The Greeks however used for the same purpose, "a polypus scalpel, having its extremity shaped like a myrtle leaf," which was a double instrument, the other end being a scoop ²

GOLD OR SILVER KNIFE

To cut the navel cord, Caraka ³ recommends the use of a knife, made of gold, or silver, or iron To make gold and silver knives of sharp edges seems absonous to our reason, but we must remember that to cut the navel cord, a very keen edge is not required, and even now the purpose is often served by the native dhāis with a piece of split bamboo

¹ सर्पास्य त्राणकर्णाशिक्षेदनेऽङ्गुल फले ॥

Astānga Hrdaya Samhitā I १११

सर्पास्य नाम शस्त्रमाह । सर्पास्य इत्यादि सर्पास्य नाम शस्त्र नासिका कर्णाशसा क्षेदने योज्यं तच्च फले अङ्गुलाऽपरिमित अङ्गुलपरिमित फलकमित्यर्थः । अस्य सर्पमुखसदृश मुखत्वात् सर्पास्यमिति सञ्ज्ञा ।

Vāgbhatārtha Kaumūdī I १११

² Paul VI ११५

³ See foot note 4 P 65

PRATUDA

Suśruta mentions it as a knife to be used for making scarifications on the body of a lunatic ¹

The mode of holding the sharp instruments

Suśruta says ² "The vidhupatra is to be held at the junction of the handle and the blade, and all instruments used for incision should be held similarly. The vidhupatra and mandulāgrī, if used for scarification, should be held with the hand raised a little, when used for evacuating abscesses, they, as well as all other instruments, should be held by the fore part of the handle. But in the case of children, old or delicate or timid persons, women, and kings and princes, abscesses should be evacuated with the trikūreeka. The vihmukha is to be held with the thumb and forefinger, its handle being covered within the palm. The kuthārikā is to be held in position with the left hand, and struck with the middle finger when let go forcibly from the under surface of the thumb of the right hand. The ārā, karipatra and esanī should be held at their extremities

¹ प्रतुदेदारचेत्भेन' समंघात विवर्जयेत् ।

सर्पिधाने जरत्कृपे सतत वा निवासयेत् ॥

Suśruta Samhitā, VI 111

² तेषामययोग यश्च समासोपाय कश्चैव वक्ष्यते । तत्र वृद्धिपत्रं हन्तफलसाधारणे भागे गृह्णीयाद्वेदनान्येव सर्वानि । वृद्धिपत्रं मण्डनायस किञ्चिदुत्तानपाणिना लिखने बहुशोऽवचार्यं हन्ताये विस्त्रावणानि । विशेषेण बालहृदसुकुमार भोरु नारीणां राज्ञा राजपुत्राणाञ्च विकृष्टकेन विस्त्रावयेत् । तान् प्रच्छादित हन्तमद्भुष्ट प्रदेशिनीभ्यां व्रीहिमुख । कुठारिका वामहस्तन्यस्नामित-
रहन्त मध्यमाङ्गुल्याद्भुष्ट विष्ठब्ध्याभिरन्यात् । आराकरपदैपण्यो मूले । शेषाणि तु यथायोगं गृह्णीयात् ।

The operation of puncturing or tapping may be demonstrated on leather bags, bladders and pouches, filled with slush, scarifications, on stretched pieces of leather covered with hair, opening on the veins of dead animals or on stalks of water-lily, probing on worm-eaten wood, bamboo, reed, tube or dried bottle-gourd, extraction, on the pulp of jack fruit, the Biel fruit (*Figle Marmelos*), Vimbli fruit (*Cephalandra Indica*) or on the teeth of dead animals. Evacuation on a lump of wax applied to a board of Śilmi wood (*Bombax Malabaricum*), sewing, on the two ends of a thick piece of cloth or soft leather, bandaging on the limbs of a dummy (human figure made of cloth and clay), bandaging the root of the ear, on a piece of soft flesh, or the stalk of a water-lily, application of cauteries, on pieces of flesh, introduction of tubes for clysters (urthral, rectal and vaginal) and wound-syringe, on the spout of an earthen vessel filled with water, or on the mouth of a bottle-gourd or similar objects."

CHAPTER VII.

THE ANUŚASTRA

The anuśastra means substitutes for cutting instruments They are the following¹ —

1 Bamboo 2 crystal 3 glass 4 ruby 5 leeches 6 fire 7 caustics 8 the nails 9. leaves of Goṣi (Elephantopus Scaber), 10 Śephālikā (Nyctanthe Arboristius), and 11 Śākhā (Tectona Grandis) 12 young stems of plants 13 hair 14 finger

These are advised to be used in case of infants or timid persons or when the proper instruments are not available ²

1 BAMBOO

A piece of split bamboo is said to have been used for cutting through and cutting into some parts of the body It is still used by the native dhāis or midwives for cutting the funis

A piece of bamboo is directed to be used for applying pressure on small boils to cure them by subsidence ³ For the same purpose, the pressure of the thumb is also recommended ⁴

¹ अनुशस्त्राणि तु त्वकसारस्फटिकाचक्रुर्गन्धजलौकाग्निचारनखगोजीर्णफालिका-
शकपत्र करीरवालाङ्गुलय इति ।

Suśrūta Samhitā I viii

² शिशुना शस्त्रभौरुणा शस्त्रभावे च योजयेत् ।
त्वकसारादि चतुर्वर्गं क्लेदे भेदे च बुद्धिमान् ॥

Ibid

³ हृत्तेषु दोषेषु यथानुपूर्वम् ग्रन्थी भिषक् श्लेष्म समुत्थिते तु ॥
स्विन्नस्य विस्नापनमेव कुर्यादङ्गुष्ठलोहोपलवणेण दण्डे ।

Ibid IV xviii

⁴ अभ्यन्य स्वेदयित्वा च वेणुनाद्या तत, शनै ।
विस्नापनार्थं मृद्वीयात् तलेनाङ्गुष्ठकेन वा ॥

Cakradatta, Viṇaśothā Cikitsā

Bamboo is also mentioned to have supplied largely the materials of splints for treatment of fractures and dislocations. For this purpose it is to be split into thin layers¹. Split bamboo is still used for the treatment of fractures by the *kavirājes* and might advantageously be used by the modern surgeons as a cheap and easily available material for splint.

Dissection

It is generally supposed that the practice of dissection of the human body for anatomical studies was unknown to the ancients. But the practice of human dissection is unmistakably referred to in the *Suśruta Samhitā*². Brushes made of bamboo, barks of trees, grass roots, and hairs are mentioned as instruments of dissection. "Thus a body should be secured which is complete in all the parts and which is of a person who was not more than 100 years old, nor who died from the effects of poison or of a chronic disease. Having cleared the intestines of any faecal matter, the body should be well wrapped either in *Muñja* (*Saccharum Munja*), or grass, or barks of trees or hemp etc., put inside a cage which should be firmly fastened, in a solitary spot, in a calm river and thus allowed to decompose. After seven nights, having taken out

¹ विभग्नश्च नरं दृष्ट्वा वेष्टुखण्डेन बन्धयेत् ।

सूक्ष्मेष्टवनीतनैरण्डपत्रश्च वेष्टयेत् ॥

Hārta Samhitā, II I 1 v1

² तस्मात्समस्तगात्रमविषोपहतमदीर्घव्याधिपीडितमवर्षशतिकं निःसृष्टान्नपुरीषं पुरुषमवहन्त्यम्नापगाया निबद्धं पञ्जरस्थं सुञ्जवल्कलकुशशृङ्गादीनामन्यतमेनावेष्टिताहमप्रकाशे देशे कीरयेत् सम्यक् प्रकुपितञ्चोद्धृत्य ततो देहं सप्तरात्रादुशीरं बालवेणु वल्कलं कृच्रीनामन्यवमेन शनैः शनैरववर्षयन् स्वगादीन् सर्वानेव बाह्याभ्यन्तराहप्रत्यहं विशेषान् यद्योक्तान् लक्षयेच्चक्षुषा ।

Suśruta Samhitā, III 7

the thoroughly decomposed body, it should be slowly rubbed with a brush made either of *Usīa* (*Andropogon Muricatus*) or hair, or bamboo, or barks of trees, examining at the same time with the eyes, every division and sub-division of the body, external or internal, beginning with the skin, as delineated in the *śāstras*” Animal anatomy was also thoroughly understood as each part of the body had its own distinctive name

Hoernle¹ says “Probably it will come as a surprise to many as it did to myself, to discover the amount of anatomical knowledge which is disclosed in the works of the earliest medical writers of India. Its extent and accuracy are surprising, when we allow for their early age—probably the sixth century before Christ—and their peculiar methods of definition ***Of the practice of such dissection in ancient India we have direct proof in the medical compendium of *Suśruta*, and it is indirectly confirmed by the statements of *Caraka*. It is worthy of note, however, that in the writings of neither of these two oldest Indian medical writers is there any indication of the practice of animal dissection.”

The Greeks did not practise dissection of the human body “The anatomical knowledge of the Hippocratists was derived chiefly from dismemberment of animals, experience in slaughtering and sacrifices, and from the observation of surgical cases. Systematic dissection of the human body was out of the question owing to the religious precepts which strictly enjoined immediate burial, and to the superstitious horror of the dead which then prevailed. The supposition that outstanding individual investigators, upon rare occasions, did not hesitate to examine

¹ Hoernle *Osteology* Preface iii.

human bodies or parts of bodies (particularly) bones, in order to correct prevailing opinions, is one which, if not susceptible of direct proof, is at least probable. This supposition, besides being borne out by many statements on the part of ancient writers, is the more probable since the bodies of savages, traitors and criminals were outside the pale of religious ordinances and were therefore available, as were also accidentally obtained portions of the body, to satisfy the curiosity of scientific investigators. No one of the oft-quoted extracts from the Hippocratic writings, supposed by individual historians to refer to human dissection, is quite conclusive, whilst nowhere is there in the pathology of the day any definite trace of anatomical research upon the bodies of those dead of disease. On the other hand comparisons are frequently instituted by the Hyppocratists referring to facts acquired through zootomy or to anatomico-pathological discoveries such as might have been made in the slaughtering of beasts"¹

The study of anatomy received its impetus from the Alexandrian School. "Herophilus improved the technique and developed the terminology of anatomy and enriched it by valuable discoveries made in the dissection of human bodies, particularly in the knowledge of nerves, vessels and viscera, but also in that of the eye. With his works, systematic anatomical investigation may in fact be said to begin"²

"Like Herophilus, Erasistratos made a successful study of anatomy, even surpassing the former in knowledge of details, and in a series of observations upon the cadavers of men and

¹ History of Medicine Neuburger P. 150

² Ibid P. 177-8

animals, collected his own mistakes as well as those of others. His greatest achievement was in the study of nerves and vessels”¹

2, 3 AND 4 CRYSTAL, GLASS AND RUBY

These are recommended to be used for cutting through and cutting into some parts of the body

Glass vessels for preparing medicines are often mentioned. Śārngadhara² used it for purifying mercury

5 LEECHES

Leeches are described to be the mildest of all means for extracting blood, and are recommended for princes, children, women, and timid people³

Twelve kinds of leeches are described⁴, six of them are poisonous and six, non-poisonous

¹ History of Medicine Neuberg P 181

² काचकृष्या विनिक्षिप्य ताञ्च मृदस्त्रमुद्रया ।

विलिप्य परितो वक्त्रं मूद्रा दत्त्वा च शीषयेत् ॥

Śārngadhara Samgraha, II xii

³ नृपाद्यवालस्थविरभीरुदुर्वलनारी सुकुभाराणामनुग्रहार्थं परमसुकुमारोऽयं शोणितानसे च नोपायोऽभिहितो जलौकसः ॥

Suśrūta Samhitā, I xiii

⁴ जलमासामायुरिति जलायुका जनमासामोक इति जलौकसः । ता द्वादश तासां सविषा षट् तावत्येव निर्विषा । तव सविषा कृष्णा कर्कुरा अलगाद्वा इन्द्रायुधा सामुद्रिका गोचन्दना चेति । तास्वज्जनचूर्णवर्णा पृथुशिरा कृष्णा । वर्त्ममतस्यवदायता छिन्नोन्नतकुचि कर्कुरा । रोमशा महापार्श्वी कृष्णमुख्यलगद्वा । इन्द्रायुधवद्द्वाराजिभिश्चिविता इन्द्रायुधा । ईषदसितपीतिका विचित्र पुष्पाकृतिचिवा सामुद्रिका । गोवृषणवदधोभागे द्विधाभुताकृतिरणुमुखी गोचन्दनेति । तामिर्हृष्टे पुरुषे दशे शययुरतिमात्रं कष्टमूर्च्छा

The poisonous leeches are —

1. Kṛsnā — it is of the colour of black collyrium and has a broad head

ज्वरोदात्तदृष्टिर्भेद मृदुगमितिनिद्रानि भवन्ति । तत्र सफागद पानानिपननस्य कर्मादिपू-
योऽयम् । इन्द्रागुदादृष्टमसाधनित्येता सविषा सचिकित्सिता व्याख्याता । अथ निर्विषा ।
कपिला पिङ्गा गजुसुखी मृषिका पुष्परीकसुखी सावरीकाचेति । तत्र मन शिलारञ्जिता-
भ्यामिव पादाभ्यां पृष्टे शिथलमुद्रवर्णा कपिला । किञ्चित्पात्रावकाशा पिङ्गाशुगाच पिङ्गला ।
यह्मपाशोऽशीप्रपाशिनो दाघन्तीष्णमुखी गजुसुखी । मृषिकाकृति वर्णाऽनिष्टगन्धा च मृषिका ।
मुद्रवर्णा पुष्परीकमुद्रवर्णा पुष्परीकसुखी । शिथला पद्मपत्रवर्णाट्टाट्टाशुलप्रमाणा सावरीका
साच पदार्थः । इत्येता सविषा व्याख्याता ।

तासां प्रमाणमात्रं चक्षुष्यान्तर्या प्रयोगैर्गृहीयात् । अर्धेना गवे महति घटे सरसङ्का-
शोदकपटनायाप्य निदध्यात् । भक्ष्यान् चामामुपर्यर्च्य चक्षुष्यं धत्तूरसौदकाय कल्दा-
यूर्यक्त्य गव्याघं दण्डीदक्षानि च पत्राणि । पात्राक्षरपात्रान्यजनं भक्ष्यञ्च दद्यात् ।
समरावात् समरावात् घटमन्यं स्रष्टामयेत् । भवति चात्र ।

मूलमध्या परिव्रिता पृथो मन्दविचेष्टिता ।

अथादिपयोऽन्यपाथिन्य सविषाय न पूजिता ॥

अथ जनीको, वसीकसाध्यव्याधितमुपवेश्य भवेत् वा विगत्य चास्य तमवकाशं सद्गोमय-
चूर्णयथराजं मृत् । गृहीताय तां सर्पपरजनीकन्कीटकं प्रदिग्धगावीं सनिलसरकमध्ये
सुप्तं स्थिताविगतमसां ज्ञात्वा तामीरोगं याचयेत् । मृत्पात्राद्वर्तितुभीतावच्छन्ना कृत्वा
सुखमपात्राद्वर्तितुभीतं चीरविन्दुं शोणितविन्दुं वा दद्याच्छस्त्रपदानि वा कुर्वीत यद्येवमपि न
गृह्योपादान्या याचयेत् । यदा च निविशते, तत्र सुखदानं कृत्वा तत्र च स्तम्भं तदा
जानीयाद् गृह्णीतीति गृह्णीतां चार्धवस्त्रावच्छन्नां धारयेत् सेचयेच्च । दशे तोदकन्दूप्रादुर्भा-
वैर्जानीयाच्छुभ्रमिमादत्त इति गृह्णीतादनामपनयेत् । अथ शोणितगन्धेन न सुखे सुखमस्या
सैन्धवचूर्णेनापकिरेत् । अथ पतिता तण्डुलकण्ठप्रदिग्धगावीं तेलजवणाभ्यक्तसुखी वाम-
हस्ताङ्गुष्ठाङ्गुलीभ्यां गृहीतपुच्छा दक्षिणहस्ताङ्गुष्ठाङ्गुलीभ्यां शनैः शनैरनुलीममनुमार्जयेदा-
सुखाहामयेतावद्यावत्सम्यग्बालनिद्रानीति । सम्यग्बाला सनिलसरकान्यस्ता भोक्तुकामा सती
चरेत् । या सीदति न चेष्टते सा दुर्बान्ता ता पुनः सम्यग्बालयेत् । दुर्बान्ताया व्याधिर-
साध्य इन्द्रमदो नाम भवति । अथ सुवन्ता पूर्ववत् सन्निदध्यात् शोणितस्य च योगायोगानवेच्य
जनीकोत्रणान्मधुनावघट्टयेच्छीताभिरक्षिप्य परिपेचयेवधीतं वा व्रणं कापाय मधुरं स्निग्धशीतैश्च
प्रदेहेः प्रदिष्टादिति ।

2 Kaivūrā —it is as long as an eel with elevated stripes across the abdomen

3 Alagaiddā —it looks as if covered with hair and has large sides and black mouths

4 Indiāyudhā —or rain-bow coloured, it has rain-bow coloured longitudinal stripes on the back.

5 Sāmudrikā —it is of dark yellow colour and has variegated flower like spots on its body

6 Gocandanā —it has a bifurcated tail like the scrotum of a bull and a small mouth

The non-poisonous ones are—

1 Kapilā or the greenish one,—it has its two sides of the colour of o pigment, and on its back, it is smooth and of the colour of a green pea

2 Pīngalā or twany,—it is of a reddish-brown colour, has a round body and moves quickly

3 Śanku-mukhī or bluish-red,—it is of the colour of the liver, sucks quickly and has a long sharp mouth

4 Mūsikā or rat-like,—it has the shape and colour of a rat's tail and emits a disagreeable smell

5 Pundarika-mukhī or lotus-faced,—it is of the colour of a green pea and has a mouth like a lotus

6 Savarikā,—it is slimy, coloured green like a lotus-leaf and eight angulī long, it is to be used in veterinary practice

The non-poisonous leeches generally live in meadows and fresh water. They are to be caught with a piece of wet leather and

kept in a new large earthen pot filled with mud, water, green fungi dry fish, &c. The water is to be changed every third day and the pot every seventh day.

To apply leeches the patient is directed to lie down and the parts to be robbed dry with powdered cow dung and earth. The leeches then to be secured with a pipe containing turpene, mustard and water, to excite them, washed thoroughly with water and then applied, the body being covered with a piece of wet cloth. For extraction, a drop of milk or blood is to be applied over the desired part, continuation of which is also recommended instead. When the leech has removed the necessary quantity of blood, a small quantity of salt is advised to be sprinkled upon its head to make it drop off. Then the leech is to be put upon some powdered rice and its mouth resolved to be secured with oil and salt.

Then it is to be scalded and put in fresh water, and should be used again if it moves, but if languid, thrown away.

The leech-bites are to be smeared with honey, cold water and astringent substances, or poulticed.

Agdhitā also gives similar directions for the application of leeches.

१. अर्द्धकम्पु मरि ॥ इत सायाय योजयेत् ।
 इन्द्रायुधम्भुक्तानि इत सायाय योजयेत् ।
 इत सायाय योजयेत् । इत सायाय योजयेत् ॥
 इन्द्रायुधमिन्द्रायुधायो रोमशाय ता ।
 मरिदा मरिदायामि कण्ठपाक उदरभसा ॥
 विषमिषायाम् काये तव शरीरायुजा पन ।
 मरिदायाम् श्रेयसायाम् इत सायाय योजयेत् ॥

Dr Ray has clearly shown that "the description of leeches as given by Rhazes agrees almost word for word with that of Susruta (Sanasiad) in many places" He describes the parallelism at length and comes to the conclusion "of the use of a chapter of the Susruta on some such work"¹

6 AND 7 FIRE AND CAUSTICS

The use of cauteries in surgery has been described before under the head of the accessory blunt instruments ²

कपाय पृष्ठान्त्वक्ना किञ्चित् पोतदग्नय या ॥
 ता अप्यसम्यग् वमनात् प्रततञ्च निपातनात् ।
 सौदन्ती सलिल प्राप्य रक्तमत्ता इति त्यजेत् ॥
 अथेतरा निष्कल्क युक्तेऽम्भमि परिप्लुता ।
 अवन्तिसीमे तक्ते वा पुनश्चाश्वसिता जले ॥
 लागयेद् दृढस्त्रुक्नाङ्गं शस्त्र रक्त निपातनैः ।
 पिवन्तीरुन्नरुत स्तम्भात्कादयेन्मृदुवाससा ॥
 सप्रक्ताङ्गुष्ठं शुक्लास्त्राञ्जलीका दृष्टशोणितम् ।
 आदत्ते प्रथमं हसं क्षीरं क्षीरोदकादिव ॥
 दशस्य तोदि कण्ट्वा वा मोक्षयेद्द्वानयेच्च ताम् ।
 पटुतेलाक्तवदना स्त्राणा कण्डूना रुन्तिताम् ॥
 रचन् रक्तमदाद् भुयः सप्ताहं वा न पातयेत् ।
 पूर्ववत् पटुता दाया सम्यग् वान्ते जलौकसाम् ।
 क्लमोऽतियोगाम्भ्युर्वा दुर्ज्वान्ते स्तम्भता मद ॥
 अन्यवान्यत्र ता स्थाप्या घटे स्त्रुक्नाम्बुगर्भिनि ।
 लालादिकोथ नाशार्थं सविषा मुरस्तदन्वयात् ॥
 अशुद्धीं स्रावयेद्दृशन् हरिद्रा गुडमाचिके ।
 शतधीताज्यपिचवस्ततो लिपाथ शीतला ॥

Astanga Hrdya २ Samhitā, I १११

¹ History of Hindu Chemistry, Introduction P lxviii,

² See Page 213-9.

8 AND 11 FINGERS AND NAILS

The uses of surgeon's fingers and nails in surgical operations has been described before¹

9, 10 AND 11 LEAVES

Rough leaves such as those of Fig trees (*Ficus Indicus*), *Goji* (*Elephantopus Scaber*), *Śephālikā* (*Nyctanthes Arbor-tristis*) and *Śaka* (*Tectoma Grandis*) are recommended for scarifying abscesses if they do not heal up after repeated opening by the knife. If there is any formation of pus in the mouth or eyelids, it may be evacuated with these leaves (*Suśruta*)². These leaves are also to be used for bleeding the gums in gingivitis.

To cover the wounds, *Suśruta* gives a list of leaves to be used according to the nature of the wound and season of the year³ —

For an-deranged wounds,—use leaves of *Erandā* (*Ricinus Communis*), *Bhūjapatīa* (*Betula Bhojpatīa*), *Pātika* (*Caesalpinia Bonducella*) and *Haridā* (*Curcuma Longa*)

¹ See Page 199-202, and 204-5

² सङ्गोध्योभयतः कार्यं शिरश्चोपकुशे तथा ।
काकोडुम्बरिका गोजीपत्रे विस्त्रावयेदष्टक् ॥

Suśrutā Samhitā, IV xxii

³ परण्ड भूर्जपूतीक हरिद्राणान्तु वातजे ।
पत्रमाश्रयन् यच्च काश्मरी पत्रमीव च ॥
पत्राणि चौरह्वलाणाम्निदकानि तथैव च ।
द्रुषिते रक्तपित्ताभ्यां व्रणे दद्याद्विचक्षणः ॥
पाठामूर्ध्वाङ्गुलीनां काकमाची हरिद्रयो ।
पत्रञ्च शुक्लाशया योजयेत् कफजे व्रणे ॥

For bile or blood-distended wounds,—use leaves of *Āśvabala* (*Basella Rubra*), *Kāśmaīpatia*, (*Gmelina Arborea*), *Vata* (*Ficus Bengalensis*) and *Kumuda* (*Nymphae Lotus*)

For phlegm-distended wounds—use leaves of *Pāthā* (*Cissampelos Hexandra*), *Mūlā* (*Sansevieria Zeylanica*), *Guducī* (*Tinospora Cordifolia*), *Kākamācī* (*Solanum Nigrum*), *Haridā* (*Curcuma Longa*) and *Śuknāśā* (*Oroxylum Indicum*)

For similar purpose *Caraka*¹ recommends us to use the leaves of *Kadamva* (*Anthocephalus Cadamba*), *Ajuna* (*Terminalia Ajuna*), *Nimba* (*Azadirachta Indica*), *Pātālī*, *Pippala* (*Ficus Religiosa*) and *Aika* (*Calotropis Gigantea*)

The leaves of the padma or nymphae are to be used for handling the eyeballs and the intestines, to replace them in their proper position when prolapsed by injury² (*Suśruta*) *Caraka* recommends lotus leaves and plantain leaves as coverings to the bleeding piles,³ *Cakradatta*⁴ mentions the use of

¹ कदम्बाञ्जुननिम्बाना पाटल्या पिप्पलस्य च ।

व्रण प्राच्छादने विद्वान् पत्राण्यर्कस्य चादिशेत् ॥

Caraka Samhitā, VI 111

² भिन्न नेत्रसकर्मण्यमभिन्न लम्बने तु यत् ।

तन्निवेश्य यथास्थानमन्याविद्धशिर शने ।

पीडयेत् पाणिना सम्यक् पद्मपत्रान्तरेण तु ॥

Suśruta Samhitā, IV 11

³ कटलीदलेरभिनवे पुष्कर पत्रेय शीतजलसिक्तौ ।

प्रच्छादनं सुहृद्भृङ्गुरिः पद्मोत्पलदलेभ्यः ॥

Caraka Samhitā, VI 11

⁴ गोजीशेकालिका पत्रैरर्शं सन्निध्य लिपयेत् ।

क्षारेण वाक्शतं तिष्ठेद् यन्त्रद्वारं पिपाय च ॥

Cakradatta, Arsa Cikitsā

Gojī and Śephāhikā leaves for scratching the piles before the application of caustics to them. He also directs us to rub the small tumours with the rough leaves before the application of various ointments.¹ Śivodāsa also mentions the use of such leaves for rubbing the eyelids in the pūlva disease.² Susruta³ mentions the use of rough leaves for scratching any part.

Paul⁴ mentions the use of fig leaves, for rubbing down the hard granulation of granuloid lids.

12. YOUNG STEMS OF PLANTS

The young shoots are described to have served the purpose of a probe. Carika calls them the soft variety, the metallic ones being called the hard probes. These shoots are to be used for superficial sinuses. Susruta directs us to use the young shoots

¹ विद्वेष्यं पौष्ट्यवशात्कर्मोनी
पदभेदं शीटं पुनं प्रदिप्यम् ।

(Cakradatta, Granthavaryūha Cikitsā)

² यथावर्तमानं यथाग्राह्यं निरुद्धं च
पुनः पुनर्विरक्तं विनिरुद्धं भवेत् ॥

(Cakradatta, Netrarogya Cikitsā)

³ वत्सावन्वमिति । कर्कशगान्धिकादि पदेषु वरमघर्षणम् ।

(Jatya Candulā Ibid)

⁴ श्रीमं शीतं पिपु किं यावद्वक्तुं समर्थम् ।
कर्कशानि च यथाणि निवृत्तार्थं प्रदापयेत् ॥

Susruta Samhitā IV, 1

¹ Paul, III xxii

² See foot note 1 P 289

of the pot-herbs called Cuñca and Upāhikā (Bisella Rubra) as probes in sinuses on the eyelids and around the anus.¹

If in young people the teeth become loose as the result of some injury, the patient should be directed to live upon milk only, sucking it through the stalk of hily, and thus affording the teeth rest and a chance of being firmly fixed again.

To excite emesis, Sārngadhara,² advises us to introduce a tube of Branda (Ricinus Communis) into the throat of the patient. The vomiting is also said to have been excited by thrusting a finger or a stalk of hily down the throat.

¹ नाडी व्रणान् शल्यगर्भानुन्मायुत्सङ्गिनः शनैः ।

करिष्यान्नाग्निभिर्विषण्णं वैषयैद्विषक् ॥

नेत्रवर्त्मगुदाभ्यामुनाशोऽपक्ताः शङ्गेणिताः ।

बुधुषोऽटकजेऽङ्गणे कर्करिषयिऽनुत्ताः ॥

Susruta Samhitā, IV 1

² अभग्नाश्लितान्दन्तान् सुरक्षानवर्षाड्यनः ।

तरुणस्य मनुष्यस्य शीतैराल्पविह्वलिः ॥

सिक्ताम्बुभिस्ततः शिते संधातीव्रगुपाचरेत् ।

उत्पलस्य च नालिन्यैः पानविधीयते ॥

Susruta Samhitā IV 111

³ अजीर्णं कौण्डपानीयं सिन्धुपीठं वसेत् सुधौ ।

वसनपात्रयित्वा च जानुमावासने स्थितम् ॥

कण्ठद्वारगुण्डनालेन स्पृशन्तं वामयेद्विषक् ।

लघुवसतः पुनः पार्श्वे द्वौ च प्रवीधयेत् ॥

Sārngadhara Samgraha, III 111,

CHAPTER VIII

HYGIENIC APPLIANCES AND HOSPITAL REQUISITES

TOOTH-BRUSH

The ancient Hindus used branches of trees as tooth-brush. They should have the length of twelve anguli and the circumference equal to that of the little finger. Suśruta directs us to use a straight and plain branch of such trees as have an astringent, or sweet or bitter, or sour taste¹. Amongst these classes of trees, the twigs of Khadira (*Acacia Catechu*), Madhuka (*Brassia Latifolia*), Nimba (*Melia Azadirachta*), Kaiñja (*Pongamia Glabra*) are the best. The end of the stick is to be chewed first to form a brush and the teeth are then to be rubbed with it. He recommends us to use some tooth-powder².

¹ तस्यैव श्लक्ष्णम् । तस्याहं नारतः ।
 कनिष्ठिका परिमाणं सूत्रयधितमम्रण ॥
 अयुक्तमन्यु रपापि प्रत्यय शस्तमृमित्र ।
 अद्वैत्यकृत्त दंष्ट्रा रस धीयस योजयेत् ॥
 कषाऽ मधुर तिक्त कटुक प्रातरन्वित ।
 निम्बर तिक्तके त्रेह कषाये खदिरमृथा ।
 मधुको मधुरे त्रेह करत्र कटुके तथा ॥

Suśruta Samhitā, IV २२१५

धीट व्योष विषर्गात् सतेन मेधवेन च ।
 चूर्णेन तेजोवत्याय दन्तानित्य विणोधयेत् ॥
 ण्कैक घर्षयेदन्तं मृदुना कर्षकेन च ।
 दन्तशोधनं चूर्णेन दन्तमामन्यवाधयन् ॥

Ibid

Bhāvamiśra mentions the names of other trees which may be used for the purpose,¹ and also gives us a list of trees to be avoided.² The use of the tooth-brush is contra-indicated in the various diseases of the mouth, ears, &c.³ Caraka⁴ advises us to use the tooth-brush twice a day

- १ अक्षं वीर्यं वटे दीप्तिं करञ्जे विजयो भवेत् ॥
 भ्रूवे चैवार्थसम्पत्तिर्वदय्या मधुरोध्वनि ।
 खदिरे मुखसौगन्धं विस्वितु विपुल धनम् ॥
 उदुम्बरे तु वाक्स्निहिरावेत्तारोग्यमेव च ।
 कदम्बे तु धृतिर्मेधा चम्पके च हृदामति ॥
 शिरीषे कीर्त्तिर्भौभाग्यं मायुरारोग्यमेव च ।
 अपामार्गे धृतिर्मेधा प्रज्ञाशक्तिस्तथाध्वनि ॥
 दाडिम्या सुन्दराकारं ककुभे कुटजे तथा ।
 जातीतगरमन्दरैर्दं स्वप्नश्च विनश्यति ॥

Bhāva Prākāśa, I 1

- २ गुवाकस्तालहिन्ताली केतकश्च बृहत्पृण ।
 खजूरं नारिकेरश्च सठैने तणराजका ॥
 तणराजं समुत्पन्नं यं कुर्याद् दन्तधावनम् ।
 नरस्याग्न्यालं धीनि स्यादद्यावद्गङ्गां पश्यति ॥

Ibid

- ३ नखादेदगलतात्सोष्टं जिह्वारोगं समुद्भवे ॥
 अथास्यपाके आसेच कासहिक्का वमोपु च ।
 दुर्बलो जीर्णं भक्त्यं भूर्च्छार्त्तमिदपीडित ॥
 शिरोरुगार्त्तस्तृषितं आन्तं पानकान्वितं ।
 अर्द्धिती कर्णशूलीच दन्तरोगोच मानव ॥

Suśruta Samhitā, IV xxiv

- ४ आपोधिताय हौ कालौ कषाय कटुतिक्तकम ।
 भक्त्येदन्तपवनं दन्तमासान्यवाधयन् ॥
 निहन्ति गन्धवैरस्य जिह्वादन्तास्यजं मनम् ।
 निष्कृष्य रुचिमाधत्ते सद्यो दन्तविगोधनम् ॥

Caraka Samhitā, I १,

Suśruta mentions the use of a tooth-brush to extract a fish-bone from the throat¹

After cleansing the mouth with water after meals, I'Tsang ordains² "Chew tooth-wood in the mouth, let the tongue as well as the teeth be carefully cleaned and purified" Again he says "It is surely not seemly for any one to spend his time after meals chaffing and chattering, nor is it right to remain impure and guilty all day and night, without preparing water in a clean jar or without chewing a tooth-wood"

He continues³ "Every morning one must chew tooth-woods, and clean the teeth with them, and rub off the dirt of the tongue as carefully as possible Only after the hands have been washed and the mouth cleansed is a man fit to make a salutation, if not, both the saluter and the saluted are at fault Tooth-wood is Danta-kāṣṭha in Sanskrit—danta, tooth, and kāṣṭha, a piece of wood It is made about twelve finger-breadths in length, and even the shortest is not less than eight finger-breadths long Its size is like the little finger Chew softly one of its ends, and clean the teeth with it If one unavoidably come near a superior, while chewing the woods, one should cover the mouth with the left hand

Then breaking the wood, and bending it, rub the tongue In addition to the tooth-wood, some tooth-picks made of iron or copper may be used or a small stick of bamboo or wood, flat as the surface of the little finger and sharpened on one

¹ मृदुना वा दन्तधावनकृष्णकेनापहरेत् ।

Suśruta Samhitā, I 1111

² I'Tsang Records of the Buddhist Religion—Trikakṣu P 267.

³ Ibid ch viii Use of Tooth woods P 33

end, may be used for cleaning the teeth and tongue, one must be careful not to hurt the mouth. When used, the wood must be washed and thrown away.

Whenever a tooth-wood is destroyed, or water, or saliva is spit out, it should be done after having made three fillips with the fingers or after having coughed more than twice, if not, one is faulty in throwing it away. A stick taken out of a large piece of wood, or from a small stem of a tree or a branch of an elm, or a creeper, if in the forest, if in a field, of the paper mulberry, a peach, a sophora japonica (Huri), willow tree, or anything at disposal, must be prepared sufficiently beforehand. The freshly cut sticks (lit wet ones) must be offered to others, while the dry ones are retained for one's own use.

The younger priest can chew as he likes, but the elders must have the stick hammered at one end *and made soft*, the best is one which is bitter, astringent or pungent in taste, or one which becomes like cotton when chewed. The rough root of the Northern Bur-weed (Hu Tai) is the most excellent, this is otherwise called Ts'ang-uh or Tsae-uh, and strikes the root about two inches in the ground. It hardens the teeth, scents the mouth, helps to digest food, or relieves heart-burning. If this kind of tooth-cleaner be used, the smell of the mouth will go off after a fortnight. A disease in the canine teeth or toothache will be cured after a month. Be careful to chew fully and polish the teeth cleanly, and to let all the mouth-water come out, and then to rinse abundantly with water. That is the way. Take in the water from the nose once. This is the means of securing a long life adopted by Bodhisattva *Nāgārjuna*. If this be too hard to put in practice, to drink water is

also good. When a man gets used to these practices he is less attacked by sickness. The dirt at the roots of the teeth hardened by time must all be cleaned away. Washed with warm water, the teeth will be freed from the dirt for the whole of life. Tooth-ache is very rare in India owing to their chewing the tooth-wood.

TOOTH-PICK

Susruta advises us to use sticks of grass as tooth-pick after meals to extract particles of food lodged between the teeth, otherwise these will decompose and the mouth would be smelling badly.¹ Bhāwisā gives similar directions but adds that if any particles of food cannot be easily extracted by the tooth-pick, one must not use any force to extract them.² "After eating they cleanse their teeth with a willow stick and wash their hands and mouth."

THE TONGUE-SCRAPER OR TONGUE SCRAPER

Susruta says: "To scrape the tongue, a golden, or silver, or

¹ दन्तान्तरगत चात्रं शोधनेनाहरेच्छने ।

कुश्यादनाद्यैः तपि मुखस्यानिदग्म्यता ॥

Susruta Samhitā, I 151

² एव भक्ष्ये भक्ष्यानिदूषणं पूर्व्वकम् ।

भोजने दन्तलग्नानि निर्हृत्याचमनं चरेत् ॥

दन्तान्तरगत चात्रं शोधनेनाहरेत् शनैः ।

कुश्यादनिर्हृतं तपि मुखस्यानिदग्म्यताम् ॥

दन्तलग्नमनिर्हृत्य तेषु मन्थेत दन्तवत् ।

न तत्र वदुःश कुश्याद् यत्र निर्हरेण प्रति ॥

Bhava Prākāśa, I 1

¹ Bodhi's Records of the Buddhist Religion Trans. from Hsuen Tsung, vol. 1, p. 77

wooden scraper is to be used. It should be ten anguli long and must be pliant and polished”¹ Caraka² mentions tongue-scraper of copper, lead or brass Bhāvamisa³ also gives a similar description. It is to be used for scraping the deposit on the tongue. It is still commonly used in India.

RAZOR AND SHEARS THE PRACTICE OF SHAVING

Every one is recommended by Suśruta to have his beard shaved, hair trimmed and nails pared.⁴ Caraka⁵ also advises

¹ जिह्वानिलेखन रीप्य सीवर्ण वार्धमेव च ।

तन्मलापहर शस्त मृदुलक्ष्य दशाङ्गुल ॥

Suśruta Samhitā, IV ५५५

² सुवर्णरूप्यताम्राणि तपुरीतिमयानि च ।

जिह्वानिलेखनानि स्युरतीक्ष्णान्यव्यूनि च ॥

जिह्वामूलगत यच्च मलमुच्छ्वासरोधि च ।

सौगन्ध्य भजते तेन तस्माज्जिह्वा विनिर्लिखित ॥

Caraka Samhitā, I ५

³ जिह्वानिलेखनैश्चैव राजत ताम्रज तथा ॥

पाटित मृदु तत् काष्ठ मृदुपवमय तथा ।

“तत्काष्ठ” दन्तशोधनयोग्य काष्ठम् ।

दशाङ्गुल मृदु मिश्र तेन जिह्वा लिखेत् सुखम् ।

तज्जिह्वा मलवैरस्य दुर्गन्ध जडता हरम् ॥

Bhāvya Prakāśa, I १

⁴ पापोगमन केशनखरोमापमार्जन ॥

हर्षलाघव-सीभाग्य-कस्मत्साह वर्द्धन ।

वाणवार मृजावर्ण तेजोवल विवर्द्धन ॥

Suśruta Samhitā, IV ५५५

तवाटित एव नीचनखरोमा ५ ५

Ibid

⁵ पाटिक हृष्यमायुष्य यच्चिरपविराजनम् ।

केशमशुनखादीना कम्पन सप्रसाधनम् ॥

Caraka Samhitā, I ५

us to shave regularly, that is thrice in a fortnight ¹ Bhāvamisia says that 'this practice conduces to health, beauty, longevity and purity' and should be observed every fifth day ² Razor is mentioned in the Rgveda ³ and in the Kāthopamsad of the White Yānu ⁴ In the Śatupitha Brāhmana, we find the method of shaving well described "Then (in shaving) are used a porcupine-quill spotted in three places and a copper razor that three-spotted porcupine's quill resembles the three-fold science and the copper razor resembles the Brāhmana, for Brāhmā is fire and fire is of reddish (lohita) colour, hence a copper (lohit) razor is used"

Again we read -- "For impure indeed, is that part of man where water does not reach him. Now at the hair and beard, and at the nails the water does not reach him, hence when he shaves his hair and beard, and cuts his nails, he does so in order that he may be consecrated after becoming pure."

¹ हि पक्ष्म कृष्णमृद्धीमात्वान् मणार्थम् ।

Caraka Samhitā, I, viii

² पञ्चरात्राश्रय मृद्भस्मस्नानाणि कर्तव्यम् ।

भस्ममृद् भस्मादीनां कर्तनं मणमाधनम् ।

पीठिक धन्यसायुष्य शीघ्रकान्तिकर परम् ॥

³ "मणमाधनम्" शोभाश्रगकम् ॥

Bhāva Prakāśa, I, 1

⁴ स न शिशोर्हि भुरिजोर्विव चुरराश्वराथो विमोचन ।

Rgveda, SM. I, 8, 5 A, 7 A, 16 V

⁵ चूर्णस्य धारा निशिता दुरत्यय दुर्गन्धयस्तन् कवयो वदन्ति ।

Kāthopamsad, I, iii

⁶ Śatupitha Brāhmana, II, 6, 1-5

⁷ Ibid. 111, 1-2, 2

3 Now some shave themselves all over, in order that they may be consecrated after becoming pure all over, but let him not do this. For even by shaving the hair of his head and his beard, and by cutting his nails he becomes pure, let him therefore shave only the hair of his head and his beard, and cut his nails.

4 In the first place he cuts his nails, first of the right hand, for in human (practice) those of the left hand (are cut) first, but with the gods in this manner. First he cuts those of the thumb—for in human practice those of the little fingers are cut first, but with the gods in this manner.

5 He first passes (the comb) through his right whisker—for in human (practice they comb) first the left whisker, but with the gods in this manner.

6 His right whisker he moistens first with the text "may this divine water be propitious unto me"

There upon he lays a stalk of sacrificial grass on (the hair of the whisker) with the text "O plant, protect me". Thereto he applies the razor, with the text "O knife, injure him not"

8 Having cut off (part of the stalk and hair), he throws it into the vessel of water. Silently he moistens the left whisker, silently he lays the stalk of grass on it, and having silently applied the razor thereto and cut through (it and the hair) he throws them into the vessel of water.

He then hands the razor to the barber, and the latter shaves off the hair and beard. When he has shaved the hair and beard

10 He bathes

12. He steps out (from the water) towards the north-east, with the text "cleansed and pure I go forth from them."

13. He then puts on (a linen) garment etc.

* "The Atharvaveda relates how when the ceremony of shaving off his beard was performed on King Soma, Vāyu brought the hot water and Savitrī skillfully wielded the razor."

In para. 3 quoted above we have evidence of the practice of depilation of the pubes which is here forbidden. There are six major rules and six minor rules of ordination for the female members or Śramanīs of the Buddhist order. One of the six minor rules is "A female must not shave the hair in any place but the head." Aristophanes, a contemporary of Hippocrates, Persius and Juvenal refers to the depilation of the pubes as being common among certain classes, and the early Christian Fathers deplore the practice. See also the remarks of Suetonius on the conduct of Domitian.⁶ Prosper Alpinus (16th century) "found the custom still prevalent among the Egyptian women."⁷ "The custom survived in France, and Italy in the 16th century."⁸

KṚSĀ PRAŚĪDHANĪ OR COMB

Suśruti directs us to comb the hair to free the head from dust

¹ Macdonnell's Sacred Literature, p. 164.

See ITsing, p. 97, Foot note 3. Amiya Samadhiha Chap. xii.

Hippocrates, Run 516, Lys 89, 151.

² Persius, iv, 37.

³ Juvenal, vii, 111.

⁴ Suetonius, xvi.

Medicina Aegyptiorum, III, xv.

⁵ Milne, Surgical Instruments &c., p. 90-91.

louse and dandruff¹ Bhāvamīśa advises us to comb the hair every day to keep it clean, as it stimulates the growth of hair² Caraka³ also recommends us to keep the hairs clean. The practice of combing the hair is very ancient, the Atharva-veda mentions a comb with a hundred teeth.

LOOKING-GLASS

The looking-glass should be constantly used as thereby the complexion is said to be improved and life prolonged⁴. For an account of the looking-glass of the ancient Hindus, see Mitra's Indo-Aryans⁵.

DRESS

Silk, chintz and red clothes are good for the winter, for they are said to be useful for derangement of air and phlegm. Thin silk is cooling and is efficacious for bilious disorders, so it should be used during the summer. It should be coloured twany or red. White clothes are auspicious and are neither hot

¹ केशप्रसाधनी केश्या रजोजन्तु मलापह्ना ।

Suśrūtā Samhitā, IV २२१४

² केशपाशे प्रकुर्वीति प्रसाधन्या प्रसाधनम् ।

केश प्रसाधन केश्य रजोजन्तु मलापह्नाम् ॥

Bhāva Prakāśa, I १

³ साधुवेश प्रसाधितकेशो * *

Caraka Samhitā, I १००

⁴ आदर्शालोकन प्रोक्तं माङ्गल्यं कान्तिकारकम् ।

पीष्टिकं बल्यमायुष्यं पापलङ्घी विनाशनम् ॥

Bhāva Prakāśa, I १

nor cold, therefore they should be worn during the rains¹. Caraka says that pure dress conduces to longevity, happiness and fortune².

UŚĀSA OF HEAD DRESS

Suśruta³ advises us to use a cap on our head which is thus protected from injury. Bhāvanīśra says that the habitual use of some form of covering for the head stimulates the growth of hair, increases beauty of the head and protects it from dust, draughts and accumulation of phlegm. Only light caps should be used as the heavy varieties derange bile and cause diseases of the eyes⁴. For the diagrams of the various forms of turbans used by the ancient Hindus, see Mitra's *Indo-Aryans*⁵.

- १ कोशेयौर्दिक दम्बः रजवन्मथेय च ।
 वातघ्नेन ररन्तु शीतकाने विधारयेत् ॥
 “कीर्दियं” पाम्पः वसरवम्बः ।
 मेध्य सुशीतम्विषाः कणाः वम्बमुष्यते ।
 तद्वारयेदृषकाले तवापि मृद्यु शम्यते ॥
 कणशरीरुटी इति लोके, कपाः रागरक्तं वा ।
 शृङ्गु शुभट वन् शीतातप निवारणम् ।
 नवीरप्रचवा शेतन्तु वर्षासु धारयेत् ॥

Bhāva Prakāśa, I 1

- २ कान्य यशस्यमाप्यमलर्क्षीघ्नं प्रहर्षयम् ।
 शीतत् पारिपट शक्त निम्नैलाम्बरधारणम् ॥

Caraka Samhitā, I १

Bhāva Prakāśa, I 1

- ३ पवित्र केशमुष्णीय वातातपरजोऽपह ।

Suśruta Samhitā, IV xxiv

- ४ उष्णीय क्लान्तिरुतकेशः रजोवात कफापहम् ।
 लघु तच्छस्यते यच्चाटु गुरु पित्ताद्विरोगकृत् ॥

Bhāva Prakāśa, I 1

⁵ The Indo Aryans, Vol. I, p 220

CHÂTRA OR UMBRELLAS

Suśruta says Umbrellas are useful for protecting men from the rains, draughts, glare of the sun, exposure to cold, and dust. They are auspicious and are beneficial to the eyes¹. Caraka² advises us to use it as it protects us from the sun, rain &c. Bhāvamiśra³ also describes its efficacy similarly. Umbrella is one of the insignia of royalty in India, and is always held over the heads of kings as shown in the Sanchi and Amarāvati sculptures⁴. It is still commonly used in India.

YASTI OR STICKS

Caraka⁵ directs us to use a stick as a support. Suśruta says "By using sticks, a man gains in strength, prowess and manliness. He becomes courageous, patient and forbearing. He can stand erect and is not troubled by any fear"⁶. It

¹ वर्षानिलरजोघर्मे हिमादीना निवारणं ।

वस्थ चक्षुष्य मौजस्य शङ्कर कचधारण ॥

Suśruta Samhitā, IV xxv

² ईनेर्विधमन वल्यं गुप्तावरणशङ्करम् ।

वर्मानिलरजोऽम्बुघ्नं कचधारणमुच्यते ॥

Caraka Samhitā, I v

³ क्ववस्थ धारणं वर्षातपवात रजोऽपहम् ।

हिमघ्न हितमच्छोथ माङ्गल्यमपि कौर्तितम् ॥

Bhāva Prakāśa, I 1

⁴ See Indo Aryans, I, p 266

⁵ खलतः संप्रतिष्ठानं शत्रुणाञ्च निरुदनम् ।

अवष्टम्भनमायुष्य भयघ्नं दण्डधारणम् ॥

Caraka Samhitā, I v

⁶ युग, सरीसृपव्याल विषाणिभ्योभयापह ।

अमखलन दोषघ्न स्थविरिच प्रशस्यते ॥

सत्त्वोत्साहवलस्थैर्य धैर्यवीर्य विवर्द्धनम् ।

⁷ अवष्टम्भकश्चापि भयघ्नं दण्डधारणम् ॥

Suśruta Samhitā, IV xxiv

protects a man from dogs, snakes &c. Bhāvamisia¹ apparently quotes these verses from Suśrūta

UPĀNAHA OR SHOES

The ancient Hindus used two kinds of shoes, made of wood and leather. The wooden pādūkā is recommended to be used before and after dinner.² The good effects claimed by its use are, an increase of the power of vision, strength and longevity.³ When travelling, the upānaha or leather shoes are to be used. Besides the advantages mentioned above, shoes are very comfortable to the travellers and prevent many diseases of the feet.⁴ If any one often travels barefooted, he feels out of sort, his senses fail, vision becomes impaired and his expectation of life is reduced.⁵

¹ Bhāva Prakāśa, I.

² पादुकारोहणदुर्व्यात् पूर्वं भोजनतः परम् ।
पादरोग हर इष्य' चक्षुष्यञ्चायुषो हितम् ॥

Bhāva Prakāśa, I.

³ चक्षुष्य स्पर्शनद्वित पादयोर्व्यसनापहम् ।
बल्य पराक्रमसुख इष्य पादवधारणम् ॥

Caraka Samhitā, I.

⁴ पादरोगहर इष्य रक्षोघ्न' प्रीतिवर्धन ।
सुखप्रचारमोजस्य सदापादवधारण' ।
अनारोग्य सनायुष्य चक्षुषोरुपधातकृत ।
पादाभ्यामनुपानङ्गा सदा चक्रमण' नृणाम् ॥

Suśrūta Samhitā, IV 321v

⁵ उपानहधारण नेत्रमायुष्य पादरोगहत् ।
सुखप्रचारमोजस्य इष्यश्च परिकीर्तितम् ॥
पादाभ्यामनुपानङ्गा सदा चक्रमण' नृणाम् ।
अनारोग्य सनायुष्यमिन्द्रियघ्न नष्टष्टिम् ॥

Bhāva Prakāśa, I.

The Hindus wore sandals like the ancient Greeks. They also used boots, which look like the modern boots used by Europeans. Buddha gave the Bhikkhus permission to wear boots or shoes, with thick lining¹. Hsuen Tsiang² says that "here (Avantī) Tathagatha gave permission to the Bhikkhus to wear kih-fu-to (boots)". For an account and figures of ancient boots used by the Hindus, see Indo-Aryans³.

VĪJANĪ AND CĀMARĀ THE FAN

The fan was used for driving the patients to drive away flies⁴. Sūśruta mentions the cāmarā *i.e.*, the tail of the Thibetan yolk (*Bos grunnius*) to be used as a fan. "It soothes the inflammation of boils and also acts as a fly-brush to prevent infection of the open wound"⁵. The cāmarā is also one of the insignia of royalty and as such we have many representations of it in the sculptures of ancient India⁶. For diagrams of the ancient fan, see Indo-Aryans⁷.

Caraka directs us to use a kulā or fan to winnow corn, prepared from the kāsā (*Saccharum Spontaneum*) to resuscitate a still-born child⁸.

¹ Mohāvagga, vāga 13 ff 6. S. B. E. vol xvii p 35

² Beal's Records of Buddhist Religion, vol II p 280

³ Indo Aryans, Vol 1, p 123 6

⁴ बालव्यजन मौजस्य सच्चिकादीनपोहति ।

शोषदाह असस्वेद मूच्छाप्नो व्यजनानिल ॥

Susruta Samhitā, IV xxiv

⁵ व्यज्येत बालव्यजनैर्द्रव्यं न च विषष्टयेत् ।

Ibid, I viii

⁶ See Indo Aryans, vol II, p 267 70

⁷ For diagrams, see Indo Aryans, vol I, p 263

⁸ तथा रुक्तेशविहृतान प्राणान् पुनर्लभेत कणकपालिकाशूर्पेण चैनमभि निष्पुनीयाद्-
यश्चेष्ट स्यात् यावत् प्राणानां प्रत्यागमनं तत्तत्सर्वमेवकुर्वत् ॥

Caraka Samhitā, IV. viii.

Bhāwansar mentions fans made of the following materials - palm-leaf, bamboo, wolf's tail, cloth, peacock's feather and cane. He attributes special properties to each fan.

Rājarambha says that the palm-leaf fan overcomes disturbances of the three humours and is light and agreeable, the bamboo fan cools heat and irritability, and promotes moderate secretion of the excrement of wind and bile, the cane, cloth and peacock's feather fan, overcomes disturbances of the three humours, the hair fan is invigorating etc.*

The Buddhist Pāṇini used the palm-leaf fan. "Not unfrequently there is added a lotus-leaf striped fan, made from a single frond, with an ending of bamboo or light wood, and furnished with a handle of silver like the letter 'S'." The palm from which the leaf is taken, is also that used for the mes, namely the Palpāt, hence the name Palpāt given to the Bhikkhus by the early Portuguese adventurers in Burma. When he attended a meeting at which women are likely to be present, every Bhikkhu must have the fan†.

१ तान्मन्त्रिणीं दातुं शक्यं यथापरा ।
 तान्मन्त्रिणीं दातुं शक्यं यथापरा ॥
 वन्यजनगुणं रक्षितप्रकोपम् ।
 वानरी वन्यजनगुणं रक्षितप्रकोपम् ॥
 एते दातव्यतां दाता शिष्या इत्या मुपनिता ।

Bhāva Prakāśa, I 1

तान्मन्त्रिणीं दातुं शक्यं यथापरा । वन्यजनगुणं रक्षितप्रकोपम् ।
 वानरी वन्यजनगुणं रक्षितप्रकोपम् । वन्यजनगुणं रक्षितप्रकोपम् ।
 वानजनगुणं रक्षितप्रकोपम् । वानजनगुणं रक्षितप्रकोपम् ।

Rājarambha

* The Way of Buddha, p. 53-54

FILTERS

Filters were used by the Hindus and are recommended to be made of an earthen or metallic vessel, the mouth being closed by a piece of cloth tied round its neck

If the water be filthy, Suśruta¹ advises us to purify it by boiling it or by exposure to the sun, or by throwing hot iron balls, sand or clay balls into the water and then allowing it to cool. Such purified water should be scented with the flowers of Nāgakeśara (Mesua Ferrea), Campaka (Michelia Champaca), Utpala (Nymphaea Stellata) and Patala (Bignonia Snavicolens)

Suśruta mentions seven means of purifying polluted water², viz ,

- 1 Katakaphala or nimālaya or seeds of Strychnos Potatorum
- 2 Gomedaka or a kind of gems
- 3 Visagranthi, or root of Nelumbium Speciosum
- 4 Śaivālamūla or root of Vallisneria Spiralis
- 5 A piece of cloth
- 6 Pearls
- 7 Precious Stones and crystals

¹ व्यापन्नानामग्रिकथनं सूर्यातपप्रतापनं तन्नाथं पिण्डसिक्ततालोद्वाणं वा निर्व्यापनं प्रसादनञ्च कर्त्तव्यं नागचम्पकोत्पलपाटलापुष्पप्रभृतिभिश्चाधवासनमिति ।

Susruta Samhitā, I 117

² तत्र सप्तकलुषस्य प्रसाधनानि भवन्ति । तद्यथा । कतकगोमेदकविषग्रन्थिगोवालमूलवस्त्राणि मुक्तामणिश्चेति । पञ्चनिक्षेपणानि भवन्ति । तद्यथा । फलकं दण्डकं सुश्रवणं उदकमक्षिकाशिक्यश्चेति । समशीतिकरणानि भवन्ति । १ वातस्थापनमुदकप्रक्षेपणं शटिकाभ्रामणं व्यजनं वम्बोद्गरणं बालुका प्रक्षेपणं शिक्यावलम्बनश्चेति ।

Ibid

He mentions five kinds of means for preventing contact of the water vessel with the earth¹ —

- 1 Phalika or planks — is of Śālmali wood
- 2 Trivastaka or octagonal tripod of wood
- 3 Muñyavaya or circular pad of Saccharine Muñga
- 4 Udikamāñchikā or a raised framework of cane and bamboo
- 5 Śāla or a loop suspended by three strings

He mentions seven ways of cooling water —

- 1 Exposure to air
- 2 Sprinkling water on the vessel
- 3 Stirring the water with a rod
- 4 Fanning the water
- 5 Filtration through cotton fabrics
- 6 Putting the vessel of water on a sand bed
- 7 Suspension of the vessel in a loop

He advises us to use run water filtered through a broad piece of white and clean cloth². In collecting water from the rivers and ponds, the Hindu females still use a kalasī or earthen vessel, the mouth being closed by a piece of cloth

¹ In the English translations of the *Saṁhita Samhitā*, Bibliotheca Indica, Dr. Caṭtopādihāya translates the passage incorrectly. He misunderstood the terms phalika, &c. to be remedial agents, necessary in the purification of water.

² गा. पुन प्रधान तटपाददीताययुजि मासि श्चिश्चकवित तपटेकटेश्च्युतमथ वा ह्यग्रातनपरिभ्रष्टनयैर्वा श्चिभिर्माजनेर्गृहीत ।

Suśruta¹ deprecates impure water as injurious to the human system and advises us not to drink or bathe in such water as there is always the risk of being speedily affected with many diseases

“It (filter) forms one of the eight sacred utensils necessary for a śramaṇa of the Buddhist order. It is a strainer or water-dipper—an apparatus for filtering the water which he drinks, so that he may not, even unwillingly, take animal life”²

One of the six requisites of a Bhikṣu is *Paṇṣāṇa*, a water-strainer³

WATER VESSEL

To store water, Suśruta mentions vessels of gold, or silver, or earth⁴

“The clean water is kept separately from water for cleansing purposes (*lit* ‘touched’ water), and there are two kinds of jars (*i.e.* *kundī* and *kalasa*) for each. Earthenware or porcelain is used for the clean jar, and the jar, for water for cleansing purposes (*lit* ‘touched water’) is made of copper or iron. The clean water is ready for drinking at any time, and the ‘touched’ water for cleansing purposes after having been to the usual

¹ व्यापन्नं वर्जयेन्नित्यं तोयं यद्वाप्यनार्त्तव ।

दोषसञ्जननं ह्येतन्नाददीताङ्घ्रितन्तु तत् ॥

व्यापन्नं सलिलं यस्तु पिवतीहा प्रसाधितं ।

अथयुः पाण्डुरोगश्च त्वग्दोषमविपाकता ॥

आसकासप्रतिश्यायशूलगुल्मीदरानि च ।

अन्यान् वा विषमान् रोगान् प्राप्नुयात् क्षिप्रमेव च ॥

Suśruta Samhitā, I. 117

² The way of Buddha, p. 53

³ I'Tsing, ch. x

⁴ सौवर्णे राजने सृग्मये वा पात्रे निदध्यात् तत्सार्धकालमुपयुञ्जीत तस्यालामे भौमम् ।

Ibid

The clean jar must be carried in a clean hand, and be placed in a clean place, while the jar for the 'touched' water should be grasped by the 'touched' (or 'unclean') hand and be put in an unclean (or 'touched') place. The water in a pure and fresh jar can be drunk at anytime, the water in any other jar is called 'special water' (more fit seasonable water i.e. water to be used at certain prescribed times, probably kâlodaka) ”¹

BATHING

The Hindus in their daily life do not eat without having first washed themselves in a bath. They always use a bathing-sheet and this ancient practice is still followed.

Bhāvamīśa says² “Bathing stimulates the appetite, builds power and strength, prolongs life, allays thirst and burning sensation, cures eczema, and washes out dirt and perspiration ”

Besides the ordinary bath, there is some evidence of the use of a medical bath to cure diseases. I'Tsing says³ “The World-honoured One taught how to build a bath room, to construct a brick pond in an open place, and to make a medical bath in order to cure a disease. Sometimes he ordained the

¹ I'Tsing ch vi

² दीपनं वृष्यमायुष्यं स्नानं मौजो बलप्रदः ।
 कण्डुमलयश्च स्वेदतन्द्रा तृड्ढाह पापनुत् ॥
 वाह्येऽथ सेके शीतादौ कृष्णान्तराति पीडितः ।
 नरस्य स्नातमात्रस्य दीप्यते तेन पावकः ॥
 शीतेन पथसा स्नातः रक्तपित्तप्रणालिहृतः ।
 तदेवोष्णेन तीव्रेण बल्यं वातकफापहम् ॥
 शिरः स्नानमवच्छेद्य मय्युष्णेनाम्बुना सदा ।
 वातश्चेऽपि प्रकीर्षेतु हितन्तश्च प्रकीर्तितम् ॥

Bhāva Prakāśa, I 1

³ I'Tsing, ch vi

whole body to be anointed with oil, sometimes the feet to be rubbed with oil every night, or the head every morning, for such a practice is very good for maintaining clear eyesight and keeping off the cold” “Bathing should always take place when one is hungry Two kinds of benefits are derived by having meals after bathing First, the body is pure and empty, being free from all dirt, second, the food will be well digested, as the bathing makes one free from phlegm or any disease of the internal organs Bathing after a good meal is forbidden in the ‘Science of Medicine’ ” (Kṛikṣā-Vidyā)

DRINKING VESSEL

Scented water is advised to be drunk out of cups made of gold, or silver, or copper, or bell-metal, or lapis lazuli or earth ¹ Bhāvamiśra² also mentions cups of the same materials

“To drink from a jar holding it upright in front is no fault, but drinking in the afternoon is not permissible A jar must be made to fit one’s mouth, the top of the cover should be two fingers high, in it a hole as small as a copper chopstick is made

Fresh water for drinking must be kept in such a jar At the side of the jar there is another round hole as large as a small coin, two fingers higher than the drinking-mouth This hole is used for pouring in water, two or three gallons may be put in it A small jar is never used

¹ See foot note 2, P 65

² जलपावन्तु तास्यस्य तदभावे मृदोहितम् ।

पवित्रं शीतलं पात्रं गठितं स्फटिकेन यत् ॥

काचेन रचितं न ह्यन्यथा वैद्वयं सम्भवम् ।

Plantain leaf vessels for fruits and sweetmeats

Gold vessels for flesh

Stone vessels for whey

Copper vessels for milk

Earthen vessels for water, sherbets and wines

Glass, crystal, lapis lazuli vessels for *rājsādava* and *sattaka*

In the *Bhāva Prakāśa*¹ we have a detailed description on the subject—"A dinner service of gold is the best from a medicinal point of view, and it is supposed to be the best tonic for the eye. Eating out of silver is equally efficacious for promoting hepatic functions. A service of zinc improves the intelligence and appetite. Food served in brass utensils promotes wind and heat, but cures phlegmatic disorders and expells worms. The use of steel or glass vessel cures chlorosis, jaundice and intumescence. A stone or clay service brings on poverty. Wooden plates are good appetisers, but help the secretions of phlegmatic humour. The use of certain leaves as plates acts as an antidote against poisons. When at dinner, a water jug with a cup should be placed on the right hand. A copper vessel is the best for the purpose. The next best is an earthen pot. Vessels made of crystal and lapis lazuli are also pure and cooling"²

¹ आयसे काचपात्रे च भोजनं सिद्धिकारकम् ।

शोथं पाण्डुरं वक्ष्यं कामलापहस्तममम् ।

श्लेष्मिणि स्त्र्यस्यै पात्रे भोजनं श्रौनिवारणम् ।

दारुह्ये विशेषेण रुचिदंष्ट्रिप्रकारितु ।

पात्रं पवनमयं रुच्यं दीपनं विषपापनुत् ॥

SPOONS

I'Tsing says¹ "As to the mode of eating in the West, they use only the right hand, but if one has had an illness or has some other reason, one is permitted to keep a spoon for use "

SPITTOONS

Spittoons were commonly used by the ancient Hindus, and Caraka² mentions it as one of the things necessary for the sick room. It is also mentioned in the Mohāvagga³ "And the sethe's wife spat it out into the spittoon " Fa-Hian⁴ noticed a "stone spitting vessel in this country (Kie-sha) belonging to Buddha "

BEDPANS AND URINALS

The bedpan and urinal were also used by the patients in ancient times. Caraka mentions them to be necessary in a sick room⁵

PES BASINS

Metallic basins marked with different measures were used for holding discharges after operations. In the Aśvavaidyaka⁶

¹ I'Tsing ch. xvi

- चोपन्यस्तभ्याङ्गारं प्रतिग्रहाणि ।

१ २ ३

प्रतिग्रहाभ्योपचागयेत् ॥

Caraka Samhitā, I xv

² Sacred Books of the East VIII 1 11

³ Beal's Records, vol I Introduction, xxviii

⁴ See Page 36 and foot note 1, P 34

" पद्विंशे लोमशे नित्यं लोमान्युत्पाद्य वेधयेत् ।

प्रमाणार्थं च पादेषु रक्तं गृह्णाति बुद्धिमान् ॥

Aśvavaidyaka, XV verse 30

blood let out in the operation of phlebotomy, is recommended to be collected in a basin, so that the quantity may at once be determined

PESTLE AND MORTAR

Pestle and mortar are mentioned in the Rgveda for preparing the Soma juice ¹ And their use in pharmacy was well-known to the ancients

Besides the pestle and mortar of pharmacy, we find mention of a large wooden pestle used in reducing dislocation by Suśruta ² Caraka says that two pestles and mortars should be kept in a lying-in-room, the object being to allow the woman some kind of work, and then she will not lie down idly on her bed if there be any delay in the delivery of the child ³ Suśruta also recommends it ⁴ "The mortar (ulukhala) and pestle (musala) are to be made of very hard wood, viz., both of Vairana wood (Ciataiga Roxburghii), or the mortar of Palāśa wood (Butea Frondosa), and the pestle of Khadira wood (Acacia Catechu) The former

¹ उलूखलमुतानामवेन्द्र जलगुल ॥

* * * *

यचिह्नं त्व गृहं गृह उलूखलक युज्यसे ।

Rgveda, I M 28 S 1 & 2 R

² See foot-note 6, P 172

³ See P 39, and foot note 1, P 40

सा चेदावीमि सक्लिश्यमाना न प्रजायिताधेना ब्रूयात् उत्तिष्ठमूषलमन्यतरञ्ज गृह्णीष्वानिनेतेतद्-
द्रूखल धान्यपूण महृम्भुङ्गरधिजहि सुहृम्भुङ्गरवजृम्भस्व चक्रमस्व चान्तरान्तरा इत्येवमुपदिश्यन्त्यके ।

Caraka Samhitā, IV viii

⁴ काज्ञातीतस्याग्निं गर्भं विधेयत सधान्यमुद्रूखलभूपलेनाभिहन्त्याद्विषमे वा यानासने
सेवेत ।

Suśruta Samhitā, III x

is to be of the height of the knee and the latter three anāhas (cubits) long¹.

On the inner face of the left pillar in the eastern gate of Sanchi Topa there is a beautiful representation of a kitchen scene in which the ancient mortar and pestle are shown. "The mortar and two-handed pestle same as those in use at the present day in India. The mortar (gokhli) is exactly the same as the Greek *κρητήνη* and the Roman *pila* and the pestle (musar) is the same as the Greek *Κοτταρα* and the Roman *polum*"².

The pestle and mortar used in pharmacy was called *śmādhilam*. It is still used to pulverise medicaments, and is made of iron or brass.

In the *Mahāvāgga*³ we find a reference to the pestle and mortar. "I allow, O Bhikkhus, the use of a *chunam* as a medicine by whomsoever has the itch or boils, or a discharge or seeds or whose body is ill smelling, and to those in health the use of dry dung, and of clay, and of coloring matter. I allow, the use O Bhikkhus, of a pestle and mortar" (*udukhalam musalañ* 74).

SIEVES, STRAINERS AND FILTERS

There is evidence that cloth sieve was used by the Hindus in ancient days, we find it mentioned in the *Rgveda*⁴. The purpose of straining and filtering solid and liquid medicines respectively is mentioned to have been served by two or

¹ Schol. on Katy. I 336 footnote Śatapathin Brāhmana (Sacred Books of the East, 1118).

² Cunningham's *Bhilsa Topos* p. 207.

³ *Mahāvāgga* VI 9 2.

⁴ *Rgveda*, 10m 71s V 2.

three layers of a piece of cloth And we know that in the prehistoric Soma rites, it "was pressed, passed through a sieve, mixed with milk, and offered as the main oblation"

The reference to a cloth sieve, we find in *Mohāvagga*¹ "Now at that time the Bhikkhus who were sick had need of sifted chunam as medicine

They told this thing to the Blessed One

"I allow, O Bhikkhus, the use of a chunam sieve"

They had need of the chunam very fine

"I allow, O Bhikkhus, the use of a cloth sieve"

Pavitra was used in the Vedic times² It was a filter Wilson translates it "Trough the purifying filters"

COLD AND HOT APPLICATIONS

To relieve colic pains, vessels made of silver, copper or precious stones, containing cold water, are directed to be placed upon the part or better upon the navel³ Besides these, leather vessels containing cold water are also directed to be used for reducing the temperature in *dilurium tremens*⁴

¹ *Mohāvagga* VI 10 1

² मध्य पुनाना कविभि पविदैर्युभिर्हिन्वत्यक्रुभिर्घनुवौ ॥

Rgveda, 3m 31 s 16 Rk

अथ दृष्टन्ति झलिनी भरिवैर्मध्व पुनन्ति धारया पविदै ॥

Ibid 3m 36 s 7 Rk

³ मणिराजत तास्रानि भाजमानि च सस्र्यंश ।

वारिपूर्णानि तान्यस्य गुलम्योपनि निक्षिपेत् ॥

Suśrūta Samhitā, VI 111

⁴ ह्यमराजत कास्याना पावाणा शीतवारिभि ।

पूर्णाना हिमपूर्णाना दृताना पवनाहता ॥

Charaka Samhitā, VI 111

Heat is directed to be applied to the patient's body in various ways¹ —

I Tāpasveda —palm of the hand, brass dish, sand, cloth, potsherd &c are the means mentioned for applying heat to the body

II Usnisveda —potsherds, stone, bricks, or iron balls are to be heated to redness and then water is to be sprinkled upon them. The part to be fomented is covered by a wet piece of thick lint and then the heated materials are to be applied over it. Or heat may be applied by means of a narrow vessel containing hot decoctions. The vessel is to be surrounded by a piece of

¹ चतुष्टयं स्वेदमदं यथा । तापस्वेद उष्णस्वेद उपनासस्वेदोद्वेग स्वेद इति ।
अतः सप्तस्वेद विद्वत्साधारणः ॥

तत्र ताप स्वेदः । पाणि काष्ठकन्दकपाल वाङ्कायस्वे प्रयुज्यते शयानस्य चाहतापो वरुण
खादिराहारिणिति । उष्ण स्वेदम् कपाल पापान्दकान्दीप्त-दिग्गजान्निवर्णान्नि रसिद्धेभ्य
द्रव्यैर्वर्त राटालकक परिवेष्टितमङ्ग-प्रदेशं स्वेदयेत् । साम रस पयोदधि धान्याम्रवातहर
पत्रमङ्ग ताप पूर्णं वा कृष्णोन्मुक्तता प्राप्त्वासाय गृह्यायात् । पार्थ छिद्रेण वा कुम्भेनाधी-
मृतेन तस्य मुखमभिमन्त्राय तामिन् छिद्रे जलि गण्डाकारा नाडी प्रणिधाय तम् स्वेदयेत् ।

सूत्रोपनिषद् स्वभस्म गुरु प्रावरणावतः ।

जम्बिगुणिकया नागा स्वेदयेत्तत रोगिण ॥

मृत्वा मूर्च्छाङ्गना ज्ञाप्या नच क्रियाति मानवः ।

व्यामार्गमात्रा विषयका जम्बि जल समाकृतिः ॥

स्वेदनार्थं जिता नानी कृमिघ्नो रस्मी शक्तिः ।

उपनास स्वेदम् वातहरमूलकलावस्त्र पिष्टैर्लवण प्रगाढे सन्निधौ सूत्रोन्मो प्रदिश
स्वेदयेत् । एष काकोल्यादिभि रसमादिभिर्निनातसी सर्वेष कर्कष कशरा पात्रमोस्कारिका-
भिर्वैभवै शान्तेनैर्वातमवस्थावनै, स्वेदयेत ।

द्रव स्वेदम् वातहर द्रव्यकाय पूर्णं कोण कटारि द्रोण्या वायगाह्य स्वेदयेत् । एव पयोसाम-
रस-पुष-हाल धान्याम्र-घृत-वसा मध्वेणवगाह्यैत सूत्रोन्म कपाय परिपिष्टेति ।

cloth to prevent the skin from being burnt. Or heat may be applied by the following device—an earthen vessel or kalasī containing hot decoctions is to be closed, and the vessel is then to be inverted. Then a hole should be bored on its side, and a tube shaped like an elephant's proboscis is fitted to it, the vapour issuing from the tube is allowed to play on the part.

To apply vapour bath—put the hot infusion of medicinal substances into an earthen vessel and close its mouth. Drill a hole into the side of the vessel and adapt a tube to it. The tube may be either metallic or wooden. The tube should be two hands (forearm and hand) long and made of three pieces, the end of the tube which should taper like a cow's tail must be six anguli long. The patient should be seated on a stool and well covered with cloth. The tube is then introduced inside the blanket, and thus the issuing vapours heat the whole body (Śārngadhara¹).

Suśruta says that the tube should be half byām (i.e., the distance between the two hands when extended) long, bent three and shaped like an elephant's proboscis. Sometimes a large stone slab is to be heated with burning wood of *Acacia Catechu*. Then after removing the ashes, the patient is directed to lie upon it. A tent or cloth-cover having four doors is sometimes required for the patient to sit in, and heat is applied by burning wood outside it.

¹ अथवा वातनिर्नाशिद्रव्यक्ताथरसादिभिः ।

उष्णैर्घटं पूरयित्वा पात्रे द्विद्वि विधाय च ॥

विमुद्रास्य विखण्डाच्च धातुजा काष्ठजा तथा ।

पङ्कजाम्बा गोपुच्छा नाडी पुञ्जात विजम्बिका ॥

मुखोपविष्ट स्वभ्यक्तं गुरुप्रावरणावृतम् ॥

रुक्मीयण्डिकया नाद्या स्वेदयेद्वातरोगिणम् ॥

III Upānīhasveda or poultices —roots of medicinal plants are to be pressed and formed into a paste with mustard, sesame etc. This is to be heated, put on a thin cloth and so applied.

IV Dravāsveda or hot bath —the patient is to sit in a tub or vessel of hot water. Iron pails or tubs are recommended to be used by patients to take bath in some infusions. Śārngadhara says¹ The tub (dronī) should be made of gold, or silver, or copper or iron, or wood. The height and length of the tub should measure thirty-six angulī each. When the patient sits inside, the height of water should stand six angulī above the navel. A dronī filled with oil is to be used for placing an unconscious patient in it to overcome the shock caused by fall, blows, fractures and other injuries.

Cakradatta² describes the four methods of applying heat, Bhāvanīśrī also describes them similarly.³ Hārīta, however, mentions seven methods of heat-application⁴

- ¹ सोवर्णं राजतं वापि ताम्रमायसञ्च दारुजम् ।
कोष्ठकं तच्च कुष्वाताभ्यां पट्टत्रिंशद्द्रुमम् ॥
आशमिनं तद्वैद्यमाशुतुष्कं ममृष्य तया ।
नामि पण्डितं श्रावण्य कथयिष्य धारया ॥

Śārngadhara Saṅgraha, III ॥

- ² तत्रैव संकतपाणिकास्थवमने, स्वेदोऽथवाङ्गारक-
लेपाद्वातहरं सप्तास्रलवणस्वेदे सुरवोष्णैर्भवेत् ।
एव तप्तपयोऽम्बुवातशमनकाथादिमेकादिभि-
स्तप्तोयनियेचनोद्भवहृद्वाप्यै, शिलायै क्रमात् ॥

Cakradatta, Svedābhikāṇa

- ³ स्वेदश्चतुर्विधः प्रोक्तस्तपोऽपस्वेदसञ्ज्ञितः ।
उपनासी द्रवः स्वेदः स्वप्ने वातार्तिहारिणः ।
तापस्वेदः चणस्वेदश्च ताभ्यां सञ्ज्ञितः ।

Bhava Prokāṣa, I ॥

- ⁴ स्वेदः सप्तविधः प्रोक्तो लोष्टस्वेदो वापस्वेदोऽग्निज्वालास्वेदः ।
घटस्वेदो जलस्वेदो ज्वरस्वेदो बालुकास्वेदश्च ।

Hārīta Saṁhitā, V ॥

BALANCE OR MĀNADANDA

For weighing medicinal substances, the scales and balance are often mentioned. They mention a set of weights and measures to be used in weighing substances. Alberuni¹ describes the Hindu balance thus — “The balance with which the Hindus weigh things, are *χαρις τιμονέες* of which the weights are immovable, whilst the scales move on certain marks and lines. Therefore the balance is called *tūla*. The first lines mark the unit of the weight from 1 to 5, and further on to 10, the following lines mean the tenths, 10, 20, 30, &c. In Feigusson’s Tree and Serpent Worship we have a diagram of steel-yard, where a man is represented as stepping in the scale, apparently to weigh himself². The ordinary balance is still in common use amongst the *kavvājes* of the present day.

COLLYRIUM POIS

The Hindus used to apply collyrium to their eyes, from a very early time. It is said to stimulate the growth of eye-lashes, brighten the lustre of the eye-balls and clean the pupil³.

Bhāvamīśa⁴ recommends us to use collyrium as it improves the visual power and cures many diseases of the eye. It is

¹ Alberuni’s *India Trans.*, by Sachau, vol. 1, p. 146.

² The Tree and Serpent Worship, the pl. lxxxiii fig. 1.

पद्मलं विशदं कान्तममलोद्भूतं मण्डलं ॥

नेत्रमञ्जनं सयोगादभवेष्वासलं तारकम् ।

Susutā Samhitā, IV. 1111

⁴ सोवीरमञ्जनं नित्यं हितमक्षोक्षती भजेत् ।

शोचने भवत्सर्जनं मनोज्ञं सूक्ष्मदर्शने ॥

“सोवीर” श्रेयः सुरमा इति लोके प्रसिद्धम् ।

क्षोत्तोऽञ्जनं मतं श्रेष्ठं विग्रहं सिन्धुसम्भवम् ॥

contra-indicated in patients suffering from fever, emesis, exhaustion, &c

Suśruta mentions collyrium pots of different metals intended for different kinds of collyrium then in use —

| | | | | |
|---------------|------|-----|--------------|-----------|
| gold | pots | for | sweet | collyrium |
| silver | pots | for | acid | collyrium |
| horn | pots | for | salt | collyrium |
| copper & iron | pots | for | astringent | collyrium |
| lapis lazuli | pots | for | sour or acid | collyrium |
| bell-metal | pots | for | bitter | collyrium |

He also mentions pots of ivory, or crystal, or coral, or horn, or conch-shell, or stone, or gold, or silver.¹

He also mentions a piece of bamboo for storing collyrium.² A bamboo is still used by the poor for keeping oil in India. For a similar purpose the wood of Khadira (*Acacia Catechu*) is also

टट्टैः कण्टून्तपरं दारुणं रज्जापरम् ।

अण्णारपात्रस्यैव सन्तमारुतातप्यौ ॥

नेत्ररोगा न जायन्ते तस्मादन्नं साचरेत् ।

“आताऽन्नं” कृष्णमृत्ना इति नौके प्रसिद्धं ॥ “विशुद्धं” शोधनं विनापि ।

“मित्युसम्भवम्” मित्युनाम पञ्चतन्त्रं सम्भवम् ।

गर्वा जागरितं शान्तं कृष्टितो भुक्तवान्मया ।

ज्वरातुरं शिरसातो नाणोरन्नमाचरेत् ।

Bhūva Prokūṣa, J 1

¹ See foot note 3, P 67

² कुनकाशीकगन्धामपिप्रह नलिनीम्पले ॥

पुष्पैर्विशुद्धाणापथ्यामलकं सयुते ।

सर्पिर्मधुयुतैश्चूणवणनाशामवस्थिते ॥

recommended¹ For storing oil, Dīghavala² mentions the use of vessels of stone or the horn of a lamb or non

MEDICINE GLASS

Sukti or shell of mussel was used as medicine glass The shell of the fresh water mussels unionacea is mentioned to be used for holding a dose of medicine for administering it to a patient They generally have equivalve, though not equisided, shells which are covered externally with a smooth brown epidermis and internally by a mother-of-pearl layer Such a shell "is said to have been formerly much used in England by painters for holding their colour and so the commonest variety is termed unio pictoria To apply oleaginous enimes, Suśruta⁴ recommends us to use metallic pots or the shell of mussel It is still used in India for feeding the babies with milk and also for administering medicines to the patient Heyne⁵ (1814) says that "according to the nature of the disorder, the medicines should be taken out of gold, silver or brass vessels But if these should not be at hand you may use non or even earthen vessel "

¹ सैन्धवोपहित युञ्जान्निरहित वेणुगह्वरे ।

सेदोऽप्लवृत्तश्चाज पिप्रल्य सैन्धव मधु ॥

रसमासलकक्षापि पक्क सस्यङ् निषापयेत् ।

कोशे खदिरनिर्झाणि तद्वत् चुट्टाञ्जन हित ॥

Suśruta Samhitā, VI 1111

² See foot note, 4 P 67

³ तत उपसम्कृतशरीरं प्रातः प्रातरुत्थाय पाणिगुह्निमात्रं चौद्रेण प्रतिमसञ्चोपयुञ्जीत ।

Suśruta Samhitā, IV 1

⁴ वामहस्तं प्रदेहिष्य शीतान्तिनालायां विशुद्धं स्रोतसि दक्षिणं हस्तेन मेहमुष्णान् तप्तं रजतं सुवर्णं तामसं तृपाय शक्तिनामन्यतमं यं गन्ध्या पिबुना वा मुखेण मेहमद्रुतमामिच्छेदं व्यवच्छिन्न-धारं यथान्वेन प्राप्नोति ।

Ibid IV 21

⁵ Dr Herne's Indian Tracts,

DROPPER

The Hindus used a tent of cotton as a drop conductor. Cakradatta¹ advises us to drop medicines into the eyes thus — the patient should be made to lie down in a place free from draught, the surgeon is to open his eye with the left hand, while with the right he allows 10 or 12 drops of medicine to fall from a height of two anguli on the eye from a tent of cotton immersed in medicine contained in a clean vessel.

GRIND-STONE

Grind-stone to pulverise medicaments is mentioned. In the *Mahāvagga* we find a reference to it. “I allow, O Bhikkhus, the use of a grind-stone, and of another stone to grind upon” (*pisavasi-kā-pisavapoto-kā*—*Buddhaghosha*).

STONE AND IRON MULLER

For similar purpose a stone slab and iron muller are necessary to make pastes and powders of medicines. On the inner face of the left pillar in the eastern gate of Sanchi Topes, the kitchen scene is represented, in which “a fourth woman is seated grinding spices or condiments on the sil or flat stone with a bant or round muller.”

KHAI OR ELLIPTICAL MORTAR OF STONE AND PESTLE

To prepare medicines to be exhibited to the patients, a small

¹ निपातस्थस्य वामेन पाणिनीन्मीय्य लीचनम् ।

गर्भाप्रलम्बयादेन पितृवर्च्या कनानिके ।

दश हाटश वा विट्त्न चन्द्रलाटवसेषयेत् ।

Cakradatta, Āśotantya-tintana Adhikāra

Mahāvagga vi. 32

Cunningham Cunningham & Bhukar Topes, p. 206

elliptical mortar is generally used when the medicines require to be thoroughly mixed with some excipient

The following appliances, besides those mentioned before, become necessary in pharmacy —

- 1 Iron pails of various sizes
- 2 Vessels of iron, copper, silver, brass and earth for storing medicines
- 3 Spoons of wood or darvi, large metallic spoon or hata
- 4 Iron sandamsa or pinchers
5. Rods of wood or iron
- 6 Blacksmith's bellows
- 7 Ankuśa or hooks like the elephant driver's goad
- 8 Iron hammer
- 9 Earthen crucibles of different sizes

CHAPTER IX.

THE CONCLUSION

In the recent edition of the *System of Medicine*, Prof. Albutt¹ begins his article on the History of medicine with the following observations: "The medicine of Egypt and the East, extensive and intricate as it was, in so far as it was not Greek did not contain even the rudiments of science. To it Western medicine owes virtually nothing, and in this article at any rate, it may be disregarded". Prof. Osler also speaks in the same strain "Crude and barbarous among the primitive nations, these ideas of disease received among the Greeks and Romans a practical development worthy of these peoples. There have been systems of so-called divine healing in all the great civilizations, but for beauty of conception and for grandeur of detail in the execution, all are as nothing in comparison with the cult of the son of Appolo, and of Asclepius, the god of healing." "Scientific medicine, the product of a union of religion with philosophy, had its origin in a remarkable conjunction of gifts and conditions among the Greeks in the sixth centuries."

Such opinions remind us of an assertion of Sir William Jones² "that there is no evidence that in any language of Asia there exists one original treatise on medicine considered as science". About a century has elapsed since the time of Sir William but we see that the same misconception still prevails in the minds of

¹ Albutt and Rolleston *System of Medicine*, vol. I, p. 1

² Osler and Mearns's *System of Medicine*

³ *Discourse xi* Sir William Jones's *Works*, Vol. I p. 161.

the scholars Maedonell¹ gives us a succinct account of the intellectual debt of Europe to the various branches of science and art of the Hindus but regrets that the genetic connection of Indian medicine with that of Greece can not at present be definitely settled "The question as to whether Indian medical science in its earlier period was affected by that of the Greeks can not be answered with certainty, the two systems not having hitherto been compared with sufficient care" The European mind is quite naturally in the habit of tracing all knowledge to Greece, the fountain of all then knowledge in philosophy and science But impartial writers are not wanting to vindicate the claims of the Hindus So Wise remarks as follows² — "Facts regarding the ancient history of medicine have been sought for only in the classical authors of Greece and Rome and have been arranged to suit a traditional theory which repudiated all systems which did not proceed from a Grecian source We are familiar from our youth with classical history and love to recall events illustrated by the torch of genius and depicted on our memories, and it requires a thorough examination of a subject, a careful weighing of new evidence, and a degree of ingenuousness not always to be found to alter early impressions Still candour and truth require us to examine the value of new facts in history as they are discovered, so as to arrive at just conclusions" Royle maintains³ that "from the mixture, however, of much ignorance and absurdity with what is valuable, many will be apt to despise altogether the medicine of the East But if it be recollected how long in Europe prevailed the influence of Galen,

¹ History of Sanskrit Literature, ch. xvi

² Review of the History of Medicine Introduction

³ Antiquity of Hindu Medicine, p. 61,

as well as how many absurd formulas still figure in some continental pharmacopœias, as also how comparatively recent is the time since our own was so greatly improved, some feeling of humiliation will control the pride with which we now view the medical science." Neuburger says¹, "The medicine of the Indians, if it does not equal the best achievements of their race, it least nearly approaches them and owing to its wealth of knowledge, depth of speculation and systematic construction, takes an outstanding position in the history of oriental medicine." It is no doubt unsatisfactory to find that such notions are still allowed to stand in the way of impartial conclusions by eminent men of science especially by those who write history of medicine. But it is not the fault of the historians alone, the fault lies with us for not having supplied them with adequate materials. Something has been done in this field of research by men like Wilson, Heyne, Amis, Roxle, Dutt, Theodor Shahab, Jolley, Hoernle and others, but it is nothing when compared to what is required to be done. To supply this want partially, we have endeavoured in this monograph to describe the surgical instruments of the Hindus, with a comparative study of the instruments of the Greek, Roman and Arab surgeons, and of the surgeons in modern times. By a careful study of this subject, we can not avoid the conclusion that the medicine of India though it was not Greek, contained the requirements of science and has a fair claim to be considered in the history of medicine. To it western medicine really owes something and so the subject has been studied and investigated thoroughly.

¹ Neuburger History of Medicine Trans by Playfair Vol. I p. 437.

Apart from the usefulness of the study for collecting materials for the history of medicine, there are good reasons for a critical examination of the subject. The knowledge of the Hindus in medical science was by no means rudimentary. There is evidence to show that they were inferior to none in the quality or quantity of the knowledge of the science at that early age. Hoernle says ¹ "Its extent and accuracy are surprising when we allow for their early age—probably the sixth century before Christ—and their peculiar methods of definition." They practised dissection of human bodies and their anatomical studies have the mark of high order. "We have seen that they used various forms of surgical instruments. The Hindus cut for stone cataract for the cataract and extracted the foetus from the womb." They performed abdominal section, practised cranial surgery successfully and no region of the body was thought sacred to the knife. They repaired nose and ears by plastic operations, treated fractures and reduced dislocations, and were experts in performing amputations. They reduced hernia, cured piles and fistula-in-ano by surgical technique, and inoculated and vaccinated for small-pox. Field surgery was thoroughly understood and arrows were extracted with skill. They were acquainted with the circulation of the blood,²

¹ Hoernle's Osteology, Preface P. iii

² याभिरिद शरीरमाराम इव जलहारिणीमि केदार इव च कूल्याभिरुपस्त्रिघते-
ऽमुग्धस्त्रतेचाकुञ्चन प्रसारणादिनिर्व्विशेषै । द्रुमपत्रसेवनीनामिव च तासां प्रतानासासा
नाभिर्मूलं ततश्च प्रसरन्त्यूर्ध्वमधस्तिर्यक् च ।

Suśruta Samhitā, III vii

देहस्योत्पत्तिरसृजो देहस्येनेव धार्यते ।

रक्तं जीवस्य चाधारस्तस्माद्रचेदसृग्बुध ॥

the distinction between the artery and vein,¹ the use of anesthetics, the means of arresting hæmorrhage and the proper treatment of surgical wounds. They enumerated 107 vital parts of the body to be avoided, if possible, by the surgeon in practising his handicraft."

In medicine they first propounded the humoral pathology. Though it seems fanciful in the light of modern culture, it must be admitted that no other theory has been attempted to explain the causation of disease in recent times. "They were the first nation who employed minerals internally and to them we owe the therapeutic use of mercury and arsenic in intermittents." They introduced massage, postural treatment and magnet in therapeutics. They excelled in chemistry and contrived many instruments for the preparation of chemical compounds. Atomic theory was discovered by Kanôda, and "they knew how to prepare sulphuric acid, nitric acid and muriatic acid, the oxide of copper, iron, lead (of which they had both the red oxide and litharge),"

विषता द्रवता रागद्वन्द्वं विलयनया ।

भ्रूयादिषद्यभूतानामेते रक्ते गुणा धृता ॥

रक्ते दृष्टे भवेच्छीघ्रो रक्तमग्गमेष च ।

व्यथा द्वापय पाकय कृष्टुष पीडकोद्गमः ।

इदं रक्ताद्ग नेत्रं शिराणा पूर्णता तथा ।

गावाणा गौरव निद्रा मेरी दाहय जायते ॥

Sārngadhara Samgraha, III २०

Bhūva Prakāśa, I ॥

१ इन्द्रगोपप्रभ इय प्रकृतिस्यसमस्तम् ।

Sārngadhara Samgraha, III २०

गूदा समस्थिता स्निग्धा रोहिण्य शुद्धशीणितम् ।

Astānga Hṛdaya Samhitā, II ॥

२ सप्तोत्तर मन्थयत ।

Sn̄ruta Samhitā, III ७१.

tin, and zinc, the sulphuret of iron, copper, mercury, antimony and arsenic, the sulphate of copper, zinc and iron, and carbonates of lead and iron¹ The processes of solution, calcination and distillation were discovered by them

They understood the action of drugs and no less than 500 classes of medicinal agents are enumerated and arranged according to their virtues in curing diseases, and their remedial agents have been collected from the vegetable, animal and mineral kingdoms There are 41 different forms in which the medicaments may be exhibited to the patient We have the earliest notice respecting zoology and botanical geography in their works They had a complete nomenclature of diseases which are described minutely as regards their ætiology, symptomatology, diagnosis, pathology, prognosis and treatment

Veterinary science was well known to them, and treatises on horses and elephants—*Aśvavaidyaka* and *Pālakāpya*² are still extant, and will repay perusal Even there is a treatise on the treatment of plants and trees³ Thus we see that the Hindu medical science must not be condemned offhand and requires a careful and sympathetic research by scholars, before it can be excluded from the history of the science

But I must be careful not to allow my enthusiast admiration carry me too far It is quite true that the *Ayurvedic* system has its faults It has been remarked that "it consisted of erroneous

¹ Elphinstone's History of India, 8th ed p, 160

² Another book on the medicine of elephants is quoted by Alberuni See Sachau's Preface to Indica, p 1

³ For the bibliography of the *Āyurvedic* books, see my work "Materials, Biographical and Bibliographical, for the History of Hindu Medicine" (In the press)

doctrines founded upon a most fanciful anatomy, physiology and pathology. Much indeed could hardly be expected of a science based upon an anatomy which taught that the navel "constituted a centre from which a vascular system, including 10 principal vessels originated", upon a physiology which declared that these vessels were destined to convey blood, air, bile and phlegm to all parts of the body, and upon a pathology which maintained that disease depended either upon derangements of one or more of these humours or "upon the influence of good or evil spirits" ². It must however be remembered that this criticism refers to a theory elaborated some 3000 years before. The idea that the navel formed the centre of the vascular system apparently had its origin in the fetal circulation. The position of the heart was well-known and its function as a propelling organ is

¹ यादृशं मिरा क्वां मयायति शरीरिणा ।

ना । स न निरुद्धाया प्रत च्छिन्ति समन्ततः ॥

नाभिस्था प्राणिना प्राणा प्राणानामिधुपायिता ।

मिरामिराधत्ता नाभिप्रक्षामिस्विवार्यकः ॥

तामा मृगमिराप्रनारिनामा यातवारिभ्यो दश पितावारिभ्यो दश कफवारिभ्यो दश दश रक्तवारिभ्यः ।

Suśruta Samhitā, III १३

तस्यान्तरिणं नाभिमु ज्योति स्यान् भुय गृह्यते ।

तदा धमति यातुतु देहस्त्रीनास्य वसति ॥

Ibid III १४

² A course of lectures on the Principles and Practice of Medicine delivered at Calcutta Medical College By Francis 1868

³ नातुमु खलु रसवदार्था नाद्या गर्भनाभिनाडी प्रतिवद्धा सास्य नातुराहाररस-
वीर्यमभिवृद्धति । तेनोपखेदेनास्याभिष्ठतिर्भवति ।

Suśruta Samhitā, III ३३.

the doctrine of stimulus, and Hahneman's theory of homœopathy need be mentioned here to complete the list ¹ Thus we see that even some of the eminent men of science indulged in fanciful theories in quite modern times

The study of ancient Hindu medicine has an antiquarian value It is perhaps the oldest system of medical science still extant Fragments of Egyptian and Assyrian medicine have no doubt been unearthed But these cannot be compared with the complete system of the medical science as preserved in the early Sanskrit works on the subject The Hindus believe their science of medicine to be of divine origin and this belief is founded upon the fact that the existence of the medical profession can be traced back to prehistoric times The humoral theory is mentioned in the Rgveda² which according to the consensus of opinions amongst the European savants can not be later than 2000 B C, and possibly earlier The Buddhists relate a story, how, in one of his former births, Buddha was born as a medicine-man "In the Mahosadha birth the archangel Sakka came to him as he was being born, and placing some fine sandal-wood in his hand, went away He came out from the womb holding this in his fist His mother asked him "What is it you hold, dear, as you come?" He answered "Medicine, mother!" So because he came holding medicine, they gave him the name of medicine-child (osadhadhārika) Taking the medicine they kept it in a chatty (an earthenware water-pot) and it became

¹ Medicine in modern Europe Payne in Albutt's System of Medicine, vol I, p 26, 29, 34

² श्रीमान् शरीरमकायं सूत्रवेदिषात् शर्मं वदत युमस्यती ॥

Rgveda, 1 84, 6

a drug by which all the sickness of the blind and deaf and others as many as came, was healed—so the saying sprang up, "This is a powerful drug", and hence he was called Mahosadha ('The great medicine-man')¹ This early date of the science amongst the Hindus is not exceptional. It is now well-known that so severe an operation as trephining the skull was often performed in the early stone age. "Trephined skulls from neolithic period have been found in most European countries, in Algiers, the Canaries, North America, Mexico, Peru and the Argentine"² In the Code of Hammurabi, king of Babylon (2285-2212 B. C.), there are thirteen articles regulating medical practice. One deals with the responsibilities of a surgeon performing operations on the eye. The laws Hammurabi lay down that —

"If a Physician cause a severe operation wound with a bronze operating knife and cure the patient, or if he open a tumour (cavity) with a bronze operating knife and save his eye, he shall have ten shekels of silver

"If it be a freedman, he shall have five shekels

"If it be any one's slave, his owner shall give the physician two shekels of silver

"If the physician make a severe wound with a bronze operating knife and the patient die, or if he open a growth with a bronze operating knife and the patient lose his eye, he shall have his hands cut off.

"If a physician make a severe wound on the person of

¹ Rhys David's *Buddhist Birth Stories*, vol I, p 67 68

² Neubergor's *History of Medicine*, P 8

a slave belonging to a freed man with the bronze operating knife and kill him, he shall replace the slave by another slave

"If a physician heal a broken bone or cure diseased bowels, the patient shall pay the physician five shekels of silver"¹

Homer pays tribute to Egypt for her

"Patron-god imparts

To all the Phœnian race his healing arts"

Herodotus says that the Egyptian physicians were specialists of particular diseases, and Clement of Alexandria mentions forty-two Hermetic books on medicine by the god Thot

"According to Manetho, he (Teta) constructed the Royal castle of Memphis and wrote a work on anatomy² being particularly occupied with medicine. The latter supposition is rendered more complete to a certain extent by the account, due to Ebers Papyrus³, that the method of making the hair grow, described accurately therein, was supposed to have been discovered by our king's mother, Shesh"⁴ Teta was the second king of the first dynasty of the old Memphis kingdom and flourished in 4366 B C. King Seta of the second dynasty owned a medical work which belonged to Senti or Hesepti (4266 B C), the 5th king of the first dynasty.⁵ "Tosorthios of the third dynasty, was said to have composed a treatise on medicine,⁶ a fact which

¹ Neuberger History of Medicine, P 18

² Manetho, in Muller Didot, Fragmenta Historicum Græc, vol II, pp 539, 540

³ Ebers Papyrus, Pl lxxi, 1, 5

⁴ Historian's History of the World, vol I, Egypt and Mesopotamia p 91

⁵ Ibid, p 68

⁶ Manetho, etc, vol II, p 544.

caused him to be identified with the healing god Imhotpû"¹ These facts suggest a great age for Egyptian medicine, Medicine flourished among the Assyrians "Fragments of an old work on medicine have been found, which show that all known diseases have been classified and then symptoms described, and the medical mixtures considered appropriate to each being compounded and prescribed quite in modern fashion"²

The oldest medical treatise extant amongst the Chinese is the *Neiching*, the authorship being attributed to Hwang-ti, it dates back to B C 2597. Mr Gatzlaff,³ missionary in China, has given us a short view of a celebrated work, in 40 volumes, on Chinese medicines, which is called *Ching che chun ching* i e, "Approved marking line of medical practice"⁴ So the Hippocratic treatises (460 B C) are rather modern compilations compared to these ancient books, and as told by Plato, the priest of Sais was fully justified when he addressed to Solon "You Greeks, you are but children"⁵

It will be seen again that a comparative study of the science discloses remarkable affinity to the systems of the other contemporary nations. The fabulous origin of medicine in India and Greece can not fail to attract the notice of even a casual observer. The resemblance of Daksa, the preceptor of the two Asvins, the offspring of Sun, who after learning the

¹ Ibid, p 544 and 545.

Quoted in Maspero's "The Dawn of Civilization" Edited by Prof Sayce, 5th ed p 238

² Assyria, its Princes, Priests and Peoples, Sayce, p 119

³ Proceedings of the Asiatic Society, Part VII, p 154

⁴ Royle Antiquity of Hindu Medicine, p. 67.

⁵ *Timæus*, p. 22

Āyurveda from their father became the medical attendants of the gods, to Æsculapius—the reputed son of Apollo, and his two sons Machaon and Podalirius, celebrated in the Homeric poems, is indeed remarkable. More remarkable is the belief in humoral pathology shared by the two nations, separated from each other by continents and seas, and alienated from each other by the differences in customs, manners and religion. The theory of independent origin and development falls to the ground, especially when we consider the strange coincidence in the surgical instruments used by the two nations in performing surgical operations. Some of the instruments used by the Hindus were not only identical in structure and shape to the instruments of the Greeks, but they had even the same name. Thus for instance, the *alābu yantia* of the Hindus corresponds to the description of the *cucubitula* of the Greeks, and both the terms mean a gourd. A *śrngā* is the horn, *anguli yantia* or *mudrikā* is the finger or ring-knife, *yoni-vānekṣana* is the diopter or vaginal speculum, *ankuṣa* is the hook, &c. Some instruments though they have different names are identical in structure and uses. Thus, the *Scammum Hippocraticum* or the *Plinthium Nelei* is the Greek counterpart of the Hindu *kapātaśayana*, the lithotomy binding of the *yantiaśatakam*, the clyster of the *vastiyantia*, the saw of the *kaipatra*, the needle of the *sūcī*, &c. Again many surgical operations are similarly described in both the systems, as for examples, the operations for stone and cataract may be cited. In the description of diseases, passages occur in books which seem to be a literal translation of one from the other. Thus in describing the symptoms of hydrophobia, Paulus quotes Rufus who pronounces it to be a

species of melancholy and then observes "Which reason accords also with those who say that they think they saw the image of the dog that bit them in water" The word "those" in the above sentence becomes clear to us when we read a similar passage in the kalpasthāna of the Suśruta Samhitā, and it may be thus translated ¹ "If the patient sees the image of the animal that bit him in the water or mirror, he is sure to die" Other passages might be multiplied but our limited space forbids any further quotations. All these coincidences can scarcely be accidental, and though we may not be able to trace the actual progress of medicine from India to Greece, yet the evidence in favour of its transmission is too strong to be held in doubt.

Thus the question of the relation of the medical science of the Hindus to that of the Greeks naturally suggests itself for solution. The possibility of a dependence of the either on the other can not be dismissed offhand for we have historical evidence of communication between the two nations at a very early age. We need not dwell at length upon those shoals and quagmires of historical controversies, the alleged conquest of India by Egyptian Seostus as recorded by Diodorus Seculus² in prehistoric times, the connection of the Phœnician traders as proved by the articles of merchandise,—cinnamon, aloes, onyx, agate, ebony, tin and ivory³ diamond, gold and

¹ अप्सुषा यदिवादर्शं रिट तस्य विनिर्दिशेत् ॥

वसत्यकस्माद् योऽभौषणं शलाहटापि वा जलम् ।

जलवासांशुविद्याय रिट' तमापिकीर्तित ॥

Suśrutā Sāmbhitā, V 71

² I 1b I ch 43 Nolan

³ Strabo xv 37, Quotes Megasthenes, Theophrastus quoted by MacCrindle in Ancient India as described by classical authors, p 46, Virgil Georg 11 116 17 ("India alone produces black ebony"), Georg 1 57 ("India sends Ivory"), Lonsdale and Lee's trans, Horace, odes 1 81,

embroidered work¹ the commercial enterprises of the ships of Solomon (992 B C) from Ezion-Gaber² under the guidance of the mariners of Huam (B C 980-917) which brought back the gold of "oplin," its almag tices and ivory, apes and peacocks, the possibility of an Indo-Hellenic intercourse to explain the remarkable coincidences between the systems of philosophy current amongst the two nations, and which culminated in the bold theory of Pococke³ that Pythagoras, who is generally considered to be the founder of the healing art amongst the Greeks⁴ was an adaptation of the Buddhugurus, and the assertion that Greece must have been an Indian colony before. Let us rather tread on firmer grounds and we know that two Greek physicians, Ktesias (about 400 B C) and Megasthenes (300 B C) visited Northern India. Ktesias in his *Indica* mentions the cochineal plant, its worm and dyes, monkeys, elephant and parrot. He says that the Indians were free from headache, toothache or ophthalmia and from mouth sores or ulcers. Alexander the Great (B C 327), so says Nearchus, employed some Hindu vaid in his camp in India to consult them in cases of snake-bites and other dangerous ailments. Megasthenes mentions ebony as growing in Bengal, and tiger, monkey and elephants are also alluded to. Strabo mentions that Damacus was sent to the court of Candragupta's son, but unfortunately the book he wrote about India is lost to us. Mention also should be made of the intercourse of Egypt with India under the Ptolemies and we know, that Ptolemy

¹ Birdwood's *Industrial Arts of India*, pp 263 4

² I King ix 27, xii, p. 22

³ *India in Greece*,

⁴ *Origin and Growth of the Healing Art*—Bedroo 162

Philadelphos sent an embassy headed by one Dionysos to the court of Pataliputra. Another source of dissemination of Hindu learning over the Western world is the emigration of the Buddhist monks to the kingdoms of Ptolemies and Greek Empire, as proved by the edict of Ashoka. "And the Greek Sramas (sramanas) were no other than the Buddhist sramanas (the contemporary of Clement of Alexandria has narrated to have reached Asia) to a person eternally dedicated to the riches of knowledge the Buddhist Arhat (venerable) sramana." The intercourse of the East and West after the Christian era is well illustrated with respect supply it with any proof as to the indebtedness of the Greeks and Hindus to each other though "Dioscorides" that the 1st Greek physicians were acquainted with the medical science of the Hindus, and valued themselves as their medical expert", but he more particularly shows that the Aryans were familiar with them, and extolled the healing art as practised by the Indians, quite as much as that in use among the Greeks.

But what is more important to us is a proof of the influence of the Indian medical science upon the Grecian system is the identification of drugs of Indian origin in the materia medica of the Greeks. For instance the Sacred Bean of Pythagoras has been identified with Uradum or Indian Nelumbium.¹ Hippocrates the Great, who was contemporary and kinsman of Ktesias² the court physician to the king of Persia, mentions --*Sesumum Indicum* (Tila), *Nardostachys Jatamansi*

¹ *Indivistrium* Mitter's ed. ch. 1

² *Journal of Education*, Vol. xvi, p. 170

³ *Practical Flowering Plants*, Vol. 3, p. 67

⁴ *Galen's Comment*, in *libri de articulis*

(Jatāmānsi), Beswillia Thurifera (Kunduru), Zinziber Officinale (Śingaveia), and Piper Nigrum (Mañci). Dioscorides (1st century A D) in his *Materia Medica* describes —Agallochum, Bdellium, Ebony (Diosphynos Ebenaster), Ammomum zinziberis (Ginger), Calamus aromaticus (sweet cane of Scripture), Eletteria Cardamomum (Elaci), Lycium Indicum or Russot, the product of Berberis lycium, Atiamentum (Indigo), Onyx or the operculum of an Indian shell-fish, etc In later times, we find Aetius, an Alexandrian writer of the 5th century describing Indian nuts, sandal wood, cocoanuts, etc Symon Set mentions camphor, and Paulus Aegineta (7th century A D), a writer well known for his judicious condensation of the Greek medical literature, mentions Aloes, Cantharides (Mylabris Cichory), Cloves (Caryophyllum Aromaticus), Millet (Panicum Haecum), Costos (root of Aucklandia Costos), Cassia (Cinnamomum Cassia), Indian stones as amulets, Malabathū or tejpat (Laurus Cassia), Ambar, etc

Now let us reproduce some of the conclusions arrived at by Western scholars as the result of the controversy. As regards philosophy, Colebrooke¹ asserts that “the Hindus were teachers and not learners” Cunningham² says “Indians have the advantage in point of time, and I feel satisfied that the Greeks borrowed much of their philosophy from the East” Weber³ remarks that “there is no ground whatever to suppose that Susruta borrowed his system of medicine from the Greeks, on the contrary there is much to tell against such an idea”

¹ Transactions of the Royal Asiatic Society, vol I

² Bhilsa Topes, pp 32 33

³ History of Indian Literature

Prof. Diaz of the Konigsberg University, detects the principles of Indian medicine in the medical literature of the Greeks. "It is to the Hindus" says Wise, "we owe the first system of medicine." Royle has proved beyond doubt the indebtedness of the Greeks and Arabs to the Hindus. Hume's theory that Suśruta is the Indian adaptation of the Arabic name of Suqrah or Buqrah, the Arabic corruption of the Greek Hippocrates, and that Kāśī is an adaptation of the Island of Cochae has been deservedly condemned as "an elaborate joke." Neuburger says: "The similarity between Indian and Greek medicine of the period is in its outline and in certain details so striking that it is hardly surprising that the originality of the former has frequently been questioned or even denied. The more so in that the dates of the more important Indian works are fixed with the greatest difficulty, and before the discovery of the Sanskrit manuscripts the question was almost insoluble."

viz, Paulisa, Romaka, Vasistha, Sama, and Paitamoha Both Weber and Kern have no doubt that Paulisa was a Greek and the name Romaka speaks for itself But in the Hindu medical literature there is no mention of any foreign help, and the Indian medical treatises do not contain a single technical term which points to a foreign origin It is interesting to quote the well known passage of Gaṅgī "The Yavanas (Greeks) are Mlecchas, but amongst them the science (astrology) is well established Therefore they are honoured as Rsis—how much more than an astrologer who is a Brāhman" It is a standing monument of the catholic spirit of the Hindus, and they know no better way to show their respect for the learned men of the world To this may well be contrasted the behaviour of the Greeks towards the other nations The doctrines of Pythagoras are pre-eminently Indian¹, but that philosopher has not a word to speak of the Hindus In astronomy the Greeks are indebted to Babylon Ptolemy mentions that Hipparchus worked out and improved upon the astronomical computations of the Babylonians with reference to the moon, but recent discoveries from the clay tablets have shown that the figures ascribed to Hipparchus are merely copied from the numerical values worked out in Babylon "The discovery of the precession of the equinoxes is generally ascribed to Hipparchus It was he indeed, who brought this fact to the Greeks, and he estimated its yearly amount as from 36 to 39 seconds, but it is certain that he learned about it in Chaldea, and that he obtained the elements of his calculations from the astronomical observations made on the lower Euphrates"² Paulus Aegineta

¹ See Enfield's History of Philosophy

² Historian's History of the World Vol. I, p. 596

gives us a complete system of operative surgery of the ancients Celsus, in the last two books of his work, has treated of the surgical operations with considerable accuracy, and though the former availed himself of the labours of the latter, Celsus is never mentioned as one of the sources of informations used by Paulus who appears to have been wholly unacquainted with his works, and Adams remarks "but when did a Greek writer ever acknowledge himself under obligation to a Roman"?

But are we to suppose that the Greeks wilfully concealed the names of the Indian physicians in their books? Surely not. The Greeks might not have known the real source of the informations which they probably received second-hand. There is historical evidence of an intercommunication between Greece and Persia from the time of Ktesias or the 4th century B. C. to the 6th century A. D. We also know of a tradition that the services of the Great Hippocrates—a kinsman of Ktesias, were required in the Persian court, but he declined the invitation. Again we know that books on ancient sciences of India were possibly made use of by the Persians in early times, and to this intercommunication may be due "the coincidences which have been observed between the science of the Greeks and that of the Hindus" (Royle).

As regards the indebtedness of the Persians to Sanskrit literature, "we have positive testimony on the subject, as the Baron de Sacy, in his account of the well-known Sanskrit origin of the Fables of Pilpay, states that these were first translated in Pehlevi during the reign of the Persian king Nooshirwan, who ascended the throne in 531, and died in 579 and who is reported by historians to have encouraged learning, and to have induced Grecian philosophy at his court. The translation

were made by the physician Baizouyeh who had brought the original from India with other books, and who by more than one previous journey to that country, had acquired a knowledge of Sanskrit. He is stated particularly, to have made two journeys, one for the purpose of procuring medicaments and herbs, and the other for obtaining specimens of literature of the Hindus"¹ "Previous even to this (A D 330), we hear of the Persian king Bahiam visiting, in disguise, the court of Basdeo, sovereign of Canouge, to study the laws, religion and manners of the Hindus"²

But whatever differences of opinion there may be as regards the relation of the Greeks to the Hindoos, there is no doubt that the medical science of the Arabs was materially influenced by Hindu medicine. For we know that the medical treatises of Caraka, Suśruta and Mādhava were translated into Arabic in the beginning of the 8th century A D, and the names of Sclaiac, Senac or Xaiac and Saiad occur in the Latin translations of Avicenna, Rhases, and Serapion³. Rāy dwells at length on the similarity of description of leeches as written by Suśruta and Rhazes. The modern medical science of the West is principally based on the Grecian system as preserved in the books of the Arabian authors and so indirectly depends for some particulars at least upon the Indian system.

Sachau in his preface to Alberuni's India⁴ remarks as

¹ Antiquity of Hindu Medicine, p 168 69

² Ibid, p 73

³ Rhazes 'De Emblico,' (Sclaiac Indianus), 'De Zinzibere, (Saiac) Serapion 'De Myrobolans' (Xarch Indus), 'De Emblicis et bellericis (Xarcha Indus), Avicenna 'Sub Emblico' (Sclaiac Indum)

⁴ Alberuni's India, Preface, p १११ ११२

follows —“What India has contributed reached Bagdad by two different roads. Part has come directly in translations from the Sanskrit part has travelled through Iran, having originally been translated from Sanskrit (Pali? Prakrit?) into Persian and further from Persian into Arabic. In this way, *e.g.* the fables of Kahlil and Dinnar have been communicated to the Arabs, and a book on medicine probably the famous *Canḍakī* of Ibrīhīm 1303.” The Arabs also translated “Indian works on snakes (*supavidyā*), on poison (*vi vidyā*) . . . on the veterinary art¹. But not only were the medical books translated into Arabic we have evidence that Indian doctors practised in foreign courts. Sachau continues: “Another influx of Hindu learning took place under Harun (A. D. 786-808). The ministerial family Barmak then at the zenith of their power, had come with the ruling dynasty from Bikh, where an ancestor of theirs had been an official in the Buddhistic temple Naubehar, *i.e.*, *nava vihāra*—the new temple (or monastery). The name Barmak is said to be of Indian descent, meaning *purnaka*, *i.e.*, the superior (abbot of the *vihāra*?) of Kern, *Geschichte des Buddhismus in Indien*, ii. 115, 515. Of course, the Barmak family had been converted, but their contemporaries never thought much of their profession of Islam, nor regarded it as genuine. Induced probably by family traditions, they sent scholars to India, there to study medicine and pharmacology. Besides, they engaged Hindu scholars to come to Bagdad, made them the chief physicians of their hospitals, and ordered them to translate from Sanskrit

¹ *Alt. Orient. Ind.*, Preface, p. xxxi.

² *Ind. p. x. v.*

into Arabic, books on medicine, pharmacology, toxicology, philosophy, astrology, and other subjects. Still in later centuries, muslim scholars travelled for the same purpose as the emissaries of the Barmak, *e g*, Almuwaffak, not long before Alberuni's time (Codex Vindobonensis, sive medici Abu Mansur libri, fundamentorum pharmacologiæ, Ed Selgnann, Vienna, 1859, pp 6, 10, and 15, 9) "

"Harun-al-Rashid (786-809) had two Indians Manka and Saleh, as physicians at his court"¹ Manka translated the classical work on medicine, *Susruta* (*cf* Steinschneider, *Wissenschaftliche Blätter*, Vol 1, p 79) and a treatise on poison, ascribed to Kânakya, from Sanskrit into Persian (see Prof Flugel, in *Zeitschrift der D M G* 21 148 and s 335) A Hebrew treatise on poison, ascribed to the Indian Zanik (Kanakya) is mentioned by Steinschneider *Wissenschaftliche Blätter*, Vol 1, p 65) Alberuni mentions an Indian Kankab as astrologer of Harun-al-Rashid (Renaud, *memoire sur l'Inde*, p 315) He is likewise mentioned as a physician Another Indian physician of Harun-al-Rashid is called Mankba (Renaud) In the year 1331, a work on veterinary medicine ascribed to Salotan was translated from Sanskrit by the order of Firuz Shaha after the capture of Nagorecote A copy of it was preserved in the Royal Library of Lucknow² Among the Hindu physicians of the time one *ابن دهن* is mentioned *ie*, the son of DHN, director of the hospital of the Barmaks in Bagdad This may be Dhanya, or Dhanian chosen probably on account of its etymological relationship with the name Dhanvantari the name

¹ Prof Dietz, quoted by Royle, p 64

² Maxmüller's *Science of Language*, Vol I, p 166

| | |
|---|-----------------------|
| Bdellium | Guggula |
| Tamarindus Indica | Tintidī |
| Triphala | Triphala ¹ |
| Myiobalanī | Haritaki |
| Tuipeth or Convolvulus Tuipethum | Tiivit |
| Sel or Aegle marmelos | Vilva |
| Santalum rubium | Candana |
| Melia azadirachta | Nimba |
| Tembul (Piper betel) | Tāmbūl |
| Faufil (Aiecha catechu) | Khadira |
| Nux vomica | Visamusti |
| Musa paradisiaca or plantain | Kadali |
| Moschos moschiferia (from Thibet & India) | Mrganābhī |
| Dolichos lebleb | |
| Orange or Citrus aurantium | Nāgaranga |
| Limon or citius medica | Mātulunga |
| Pearls and other precious stones such as lapis lazuli Borax, &c | |
| Rhabarbarum or Indian Rhubarb, etc | |

We can trace the Arabic and Greek names of some of the medicaments to a Sanskrit source. Royle has discussed them at length, so we need give here only a synopsis of it —

Triphalā (S)—Triphalla (A)—Tryphalla (G)—Triphala parva (modern)

Devadāru (S)—Deudar (Avicenna)—Deedara (G)—Pinus deodaru

Tvaka-kshira (S)—Tabosheer (A)

Tamālpātīa (S)—Malatiroon or Malabathium (G)

Tejapatia(s), or tuj—Sadej (A)

¹ Actuarius copies from Serapion and Mesue, the use of this medicine. The very name is Sanskrit, meaning the 3 myiobalans. Serapion refers to Tamarindus or Charul in his De Myiobalanis (Royle, p. 17)

Tāmbula (S)—Tumbol (P)—Tunbol (A)

Pippalī (S)—Pippul (H)—pūpūl (P)—fūfūl (A)—(G)—
pūpūl (E)

Singavera (S)—Shimgveez (P)—Zinzabūl (A)—Zingiber (E)

Agguu (S)—agguu (H)—Agūla (M)—Pao-d'aglia (aquila)
(po)—Aod Hindee Agallochum (G)

Candana (S)—chundan (H)—Shandana (T)—Sundul (P)—
Santal (E)

Kolinjana (S)—Galanga (G)

Vaca (S)—Wuz (A)

Dāvusita (S)—Daisheem (H)—Daisheem (A)

Caeyn-nama (C)—Akimona (P)—Kaimanis (M)—Cinnamon

Kustha (S)—Kooth (H)—Kust (A)—Koosius (G)—
Koshia (S)

Abnus—Ebony (E)

Kubara (S)—pupal (P)—fufal (A)

Sajkā (S)—Sajumattee, sajloon, saju (H)—Sajmen viti
(Gebei)—Soza oi soda (E)

Khai, khai (S)—Kali (A)

Kussas, missy (India)—misy (A)—misy (G)

Tincana (boiax)—Tinkai (P)—tincal (E)

Ambara (S)—Kharoba (A)—Ambei, Ambegise (E)

Kassis (tin)—Kassiteios (G)

Tuttha (S)—tootum oi tutia (H)—tutia (P)—tatanagum
(T)—tutenagum and tutty

Manasīlā (S)—Mansil (G)

Haritāl (S)—harital

Saikaiā (S)—sakkaia (T)—sukku (A)—Sugai (E)

Sandaracha (S) oi sulphuret of arsenic—Zainach (P & G)

Sphotaka (S)—phoska (B)—pocca (A S)—pocke (Ger)

Tintidi (S)—Tamai Hind (A)—Tamuaim (F1)—Tamarinds
(Italy & Sp)—Tamarind (B)—Tamarindus India (L)

Masunikā (S)—Masein (Ger)—Measles (E)

Vrana (S)—verole (F1)—variola (L)

Danga (Hindus)—Dandy—Dengue (Sp)

S—Sanskrit A—Arabic G—Greek T—Tamil P—
Persian M—Malayan Po—Portuguese Sy—Syriac Ger
—German A S—Anglo-Saxon H—Hindi E—English
B—Bengali Fr—French L—Latin It—Italy Sp—Spanish

Not only is the influence of the Sanskrit medical works detected in the Persian, Hebrew, Arabic, Greek and Roman works on medicine, there is evidence that the Hindu system of medicine was also adopted by the Tibetans and the Chinese. In the January No 37 of the J A S B 1835 Vol IV, an analysis of a Tibetan work is given by Alexander Csoma de Koros. It is called "rgyud bzhi" (the tract in 4 parts). It is attributed to Sakhya. "In the time of Khrisiong Dehutsan (i.e. 8th or 9th century of the Christian era) a Tibetan interpreter Banotsana (or Vairochana) having translated in Cashmere, with the assistance of physician-pandit (Davam Non-gah) presented it to the above mentioned Tibetan king." In a Note on Tibetan surgical instruments, Walsh says ¹ "The present practice of surgery in Tibet is very simple, and, as already noted, consists chiefly of cupping, cauterizing, and bleeding. The Am-chlu informed me that the only instruments used are the cupping-bow (མེ་བུང་ me-pun, or མེ་བུམ་ me-bum, both meaning 'fire vessel'), in which

¹ The Tibetan Anatomical System by E H C Walsh in J R A S 1910, pp 1244-45

paper is lit and the bowl is placed while hot over the part to be blistered, the sucking-horn (ལྷིབ་རུ་ *lyib-ru*), by which cupping by vacuum is done, the cautery (ལྷག་སྐུ་ *lehags-me*), the lancet (རྩ་རྩ་རྩ་ *rtsa-u*), for bleeding, and a golden lancet (གསེར་རྩ་རྩ་ *gser kva rtsa-u*) for operating on the eye

In the journal of the Buddhist Text Society of Calcutta for 1891 three Tibetan block prints are illustrated, which contain representations of a large number of surgical instruments, some of them of an elaborate nature, including specula, saws, catheters, exploring needles, instruments for tapping hydrocele, and midwifery and other forceps. The block-prints were brought by Rai Sanchandra Das, Bahadur, from Lhasa,¹ and a description of the figures was given by the late Lama Śes-rab MGya Mtsho, the Abbot of Ghoom Monastery, near Darjeeling, who was formerly physician to the late Tashi Lama, which were explained in a paper read by Dr Saradaprasad Banerjee.²

If the elaborate and various instruments shown in the block-print were ever in general use they appear to have now ceased to be used."

In the J R A S April 1907, is mentioned "a Chinese text corresponding to a part of the Bower manuscript" by Watanbe. The identified portion of the MSS consists of the six leaves which appear in plates XLIX-LIV (Hoernle's ed). The corresponding Chinese text is contained in six translations of which the following three, correspond completely to the MSS.

¹ Journal of the Buddhist Text Society, Vol II, Pt III, Calcutta 1894
P III

² Ibid, pp IX X

- | | | |
|---|--|-------------------------------|
| 1 | Mohamayuni vidya-rajui—translated by I'tsing | 705 A D |
| 2 | „ „ „ | Amoghavajra 746
to 771 A D |
| 3 | „ „ „ | Sanghapala 516
A D |

Again many articles are common to the Hindus and Chinese materia medica, as many aromatics (nutmeg, cloves, cinnamon and pepper), musk, rhubarb etc. And this is not at all surprising for we have evidence “that there was constant intercourse¹ between these countries even before the Christian era, by means of travellers and ambassadors, and that Buddhist priests in visiting China, took with them as presents classical Indian books. It is also worthy of note, in connexion with the chapter on this subject in Susruta, that in A D 648, the Emperor of China having sent an ambassador to India, this officer met with a doctor, who told him that he was 200 years old, and that he possessed the recipe of immortality, upon hearing which, a second embassy was despatched in search of the philosophical stone” (Royle)

Even the modern medical science of Europe has been directly influenced by the Hindu system of medicine. In the materia medica used by the doctors in Europe now, we find the following curative agents—the produce of India. I quote here the list as prepared by Thakore Shaheb² —

| | |
|-------------------------|----------|
| “Aconitum heterophyllum | Ativisha |
| Allium cepa | Polandu |
| Acacia catechu | Khadua |

¹ See Asiatic Journal, July 1836

² History of Arvan Medical Science P 128

| | |
|--|--------------|
| <i>Alhagi mauroium</i> | Yavasa |
| <i>Alstoma scholium</i> | Saptaparna |
| <i>Ammomum eleltarum</i> | Ela |
| <i>Andropogon nardus</i> | Ushna |
| <i>Andropogon schenanthus</i> | Katurina |
| <i>Artemisia sternutatoria</i> | Agnidamani |
| <i>Berberis lycium</i> | Darubandha |
| <i>Butea frondosa</i> | Palisha |
| <i>Cassia lanceolata</i> | Sonamukhi |
| <i>Cucumis colocynthis</i> | Indravatum |
| <i>Dhatura alba, niger &c</i> | Dhattura |
| <i>Justicia adhitoda</i> | Atusha |
| <i>Luffa amara</i> | Katukoshtaki |
| <i>Lanum usitatissimum</i> | Atasi |
| <i>Mallotus Philippiensis</i> | Kapillaka |
| <i>Myrica sapida</i> | Katfala |
| <i>Ophelia chiretta</i> and <i>Ophelia</i>
<i>angustifolia</i> | Kirata |
| <i>Pimpinella Anisum</i> | Shatapushpa |
| <i>Pongamia glabra</i> | Karanja |
| <i>Ptychotis ajowan</i> | Ajamoda |
| <i>Ricinus communis</i> | Eranda |
| <i>Salvinia cucullata</i> | Undukarnika |
| <i>Santalum album</i> & <i>Santalum</i>
<i>flavum</i> | Chandana |
| <i>Shorea Robusta</i> | Ajakarna |
| <i>Strychnos potatorum</i> , <i>Strychnos</i>
<i>nux vomica</i> | Katakafala |
| <i>Tinospora Cordifolia</i> | Guduci |

Valeriana Haidwicki

Tagara

Wrightia Antidysenterica

Indrayava "

To this list may be added the following, drugs from the Indian and Colonial Addendum to the British Pharmacopœa, 1898 —

| | |
|-------------------------------------|-----------------------|
| Acacia Arabica | Vāvvula |
| Acalypha Indica | Muktabarsī |
| Andrographis Paniculata | Kirāta |
| Aristolochia Indica | Arkamula |
| Arachia Hypogaea | Bucanaka |
| Citrus Aurantium | Nāgaranga |
| Azadirachta Indica | Nimba |
| Aegle Marmelos | Vilva |
| Piperbetel | Tāmbula |
| Butæa Gummi | |
| Cæsalpina Sappan | Patanga or Bakam |
| Calotropis Procea and
C Gigantiæ | Aika |
| Gossypium Herbaceum | Kārpāsa |
| Cambogia Indica | |
| Cissampelos Pariera | Ambashthai |
| Coscinum Fenestratum | Dāru-haridīā or daivi |
| Gynocardia Odorata | Chālmugra |
| Hygiophila Spinosa | Kokilāk-a |
| Anogeissus Latifolia | |
| Embelia Ribes and E Robusta | Vidanga |
| Plantago Ovata | Ispaghula |
| Ipomæa Hederacea | Kālādāna |
| Ipomæa Turpethum | Trivit |

Mylabris Phaleia

Terminalia Chebula

Sesamum Indicum

Picrohiza Kurroa

Uginea Indica

Hanatakī

Tila

Katuka

Vanapalāndu

As regards the medicines used by the Hindus, Neuberger says¹

“The Pharmacopia, corresponding with the fruitful nature of the land was a rich one and stamps Indian medicine with a character entirely its own, whilst nothing speaks more eloquently for its originality than the fact that of all the many medicinal plants no single one was European ”

Elphinstone wonders at the knowledge of simples in which the Hindus early gave lessons to Europe and “more recently taught us the benefit of smoking *Datura* in asthma and the use of cowitch against worms,” and “the prescribing of *Nux Vomica* in paralysis and dyspepsia, and the revival of the use of *Croton Tiglium*” (Royle) In surgery, too, the modern surgeons of Europe have borrowed the Indian method of Rhinoplastic operation first made known to European surgeons by a letter which was printed in the Gentleman’s Magazine for October 1791, p 891 In fact Dr Huschbeig of Berlin says that “the whole plastic surgery in Europe had taken its new flight when these cunning devices of Indian workmen became known to us The transplanting of sensible skin flaps is also an entirely Indian method ” The modern method of making pockets for the

¹ Neuberger, History of Medicine vol I P 54

testicles under the Colles' fascia after the operation for scrotal tumour (elephantiasis) can be traced back to the age of Suśruta¹

Thus we see that it can safely be affirmed that the medical science of Europe has been, both directly and indirectly, influenced by the Hindu System of Medicine

¹ पादौ निरस्तमुष्कस्य जलेन प्रोक्ष्य चाचिणी ।

प्रवेश्य तुन्यसेव वा सुष्कौ सौव्येत्त पर ॥

Susruta Samhitā, IV 11

THE END

APPENDIX

I'Tsing¹ says —

“The following are the eight sections of medical science. The first treats of all kinds of sores, the second, of acupuncture for any disease above the neck, the third, of the diseases of the body, the fourth, of demoniac disease, the fifth, of the Agada medicine (i.e. antidote), the sixth, of the diseases of children, the seventh, of the means of lengthening one's life, the eighth, of the methods of invigorating the legs and body. ‘Sores’ (1) are of two kinds, inward and outward. The disease above the neck (2) is all that is on the head *and face*, any disease lower down from the throat is called a ‘bodily’ disease (3). The ‘Demoniac’ (4) is the attack of evil spirits, and the ‘Agada’ (5, but 6 of Âyur-veda) is the medicine for counteracting poisons. By ‘Children’ (6, but 5 of Âyur-veda) is meant from the embryo stage until after a boy's sixteenth year, ‘lengthening life’ (7) is to maintain the body so as to live long, while ‘invigorating the legs *and body*’ (8) means to keep the body and limbs strong and healthy. These eight arts formerly existed in eight books, but lately a man epitomized them and made them into one bundle. All physicians in the five parts of India practise according to *this book*, and any physician who is well versed in it never fails to live by the official pay. Therefore Indians greatly honour physicians and much esteem merchants, or if they do not injure life, and they give relief to others as well as benefit themselves. I made a successful study in medical

¹ A Record of Buddhist Practices, Ch. XXVII, pp. 127-8

science, but as it is not my proper vocation I have finally given it up ”

Dr Takakusu¹ comments on the passage as follows —

“The eight sections of Medicine which I-tsing describes are no doubt the eight divisions of the *Âyur-veda*. He mentions an epitomiser of these divisions, who seems to have been a famous physician and contemporary of I-tsing (or just before I-tsing). This epitomiser may be *Susruta*, who calls himself a disciple of *Dhanvantari*, one of the Nine Gems in the Court of *Vikramaditya*.

Prof Wilson says in his Works, vol. III, p. 274 —

‘The *Âyur-veda*, which originally consisted of one hundred sections, of a thousand stanzas each, was adapted to the limited faculties and life of man, by its distribution into eight subdivisions, the enumeration of which conveys to us an accurate idea of the subject of the *As Medendī* amongst the Hindus.

The eight divisions are as follows —

I *Sālya* (I-tsing’s (1) cure of sores)

The art of extracting extraneous substances, glass, earth, bone, &c, accidentally introduced into the human body, and by analogy, the cure of all phlegmonoid tumours and abscesses. *Salya* means a dart or arrow.

II *Sālākya* (I-tsing’s (2) art of acupuncture)

The treatment of external organic affections or diseases of the eyes, ears, nose, &c. It is derived from *Sālākā*, “a thin and sharp instrument,” and is borrowed from the generic name of the slender probes and needles used in operation on the parts affected.

¹ A Record of Buddhist Practices, Ch. XXVII, pp. 222-3

The above two divisions constitute the surgery of modern schools.

III. *Kaya-likitsâ* (I-tsing's (3) treatment of the diseases of the body)

The application of the *Arś Medendī* (*Ālikitsâ*) to the body in General (*Kāya*). It forms what we mean by the science of medicine.

IV. *Bhūta-vidyā* (I-tsing's (4) treatment of demoniac disease)

The restoration of the faculties from a disorganised state induced by demoniacal possession. The art vanished before the diffusion of knowledge, but it formed a very important branch of medical practice through all the schools, Greek, Arabic, or European.

V. *Kaumara-bhūtya* (I-tsing's (6) treatment of the diseases of children)

The cure of infancy, comprehending not only the management of children from their birth, but the treatment of irregular lactic secretion, and puerperal disorders in mothers and nurses.

VI. *Āgada* (I-tsing's (5) *Āgada* medicine)

The administration of antidotes—a subject which, as far as it rests upon scientific principles, is blended with our medicine and surgery.

VII. *Râśyana* (I-tsing's (7) application of the means of lengthening one's life).

Chemistry, or more correctly alchemy as the chief end of the chemical combinations it describes, and which are mostly

metallurgic, is the discovery of the universal medicine—the elixir that was to render health permanent, and life perpetual

VIII *Vāgīkarana* (I-tsing's (8) methods of invigorating the legs and body)

Promotion of the increase of the human race—an illusory research, which, as well as the preceding, is not without its parallel in ancient and modern times'

Prof Wilson further remarks —'We have, therefore, included in these branches all the real and fanciful pursuits of physicians of every time and place. Susruta, however, confines his own work to the classes *Sālya* and *Sālākya* or surgery; although, by an arrangement not uncommon with our own writers, he introduces occasionally the treatment of general diseases and the management of women and children when discussing those topics to which they bear relation' (See Wilson's Works, vol iii, p 276)''

List of Works Consulted.

- Aetius
 Alexander Trallianus
 A l'histoire du Budh Ind
 Analecta Medica—Dietz
 Analysis of a Tibetan work on Medicine (J R A S)—Csoma de Koros
 Anglo Saxon Medicine—Payne
 Antiquities of Orissa—R L Mitra
 Antiquity of Hindu Medicine—Royle
 Archeological Survey of South India—Burgess
 Architecture of India—Ram Raz
 Aristophanes
 Arsenal de Chirurg
 Assyria—Sayce
 Aṣṭāṅga Hrdaya Samhitā—Vāgbhata II (Kunte's Ed)
 Aṣṭāṅga Samgraha—Vāgbhata I
 Aśvavaidyaka—Jayadatta Suri
 Atharva Veda—Whitney's Translation
 Avenzoar
 Avicenna
 Āyurvedārthadīpikā—Śivo Dasa Sena
 Bhāgavat—Vyāsa
 Bhānumatī—Cakradatta
 Bhāva Prakāśa—Bhāva Miśra
 Bhilsa Topes—Cunningham
 Bhoja Prabandha—Ballālā (Jivānanda Ed)
 Buddhist Jataka Stories—Rhys David
 Buddhist Records of the Western World—Beal
 Cakradatta—Cakradatta
 Cancer of the Breast—Velpau
 Caraka Samhitā— $\left\{ \begin{array}{l} \text{Agnivesa} \\ \text{Caraka} \\ \text{Drdhavalā} \end{array} \right.$
 Caturvarga Cintāmanī—Hemādri
 Celsus
 Chirurg —Albucasis
 Cikitsā Sāra Samgraha—Cakradatta
 Collection—Oribasius
 Commentary on Manu Samhitā—Kallūka Bhatta
 Dawn of Civilization—Maspero
 De Chirurgiens Grecs

- De Med Aegyptiorum—
 Dhanurveda
 Discourse xi—Jones
 Discription of Hindusthan—Hamilton
 Domitan
 Early History of India—V Smith
 Ed Med Essays—Simpson
 English Translation of Suśruta Samhitā—Dutt, Hoernle and Chattopādhyaya
 Extant Works of Aræteus—Adams
 Flowering Plants—Pratt
 Fractures and Dislocations—Hamilton
 Galen
 Genuine Works of Hippocrates—Adams
 Geography—Strabbo
 Græco Roman Surgical Instruments—Milne
 Gun Shot Injuries—Longmore
 Hārta Samhitā—Hārta
 Hasti Āyurveda—Pāṭalāpya
 Hindu Medicine—Wise
 Hist de la med —Springel
 Historia Forcipum et Vecticum—Muld 5
 Historian's History of the World
 History of Aryan Medical Science—Thakore Sahab
 History of Hindu Chemistry—Rāy
 History of India—Elphinstone
 History of Medicine—Neuberger
 History of Philosophy—Enfield
 History of the Saracens—Amir Ali
 History of Sanskrit Literature—Weber
 India—Alberuni (Translated by Sachau)
 India in Greece—Pocock
 Indian Antiquities—Prinsep and Thomas
 Indian History—Arrian
 Indian Medicine—Jolly
 Indian Physicians at Bagdad—Wilson (J R A S)
 Indian Tracts—Heynes
 Indo Aryans—R L Mitra
 Industrial Arts of India—Birdwood
 Invasion of Alexander the Great—Mcindrie
 Journal Asiatic Society Bengal, XXXIX 1870 and vol XLII 1835
 Journal Asiatique 1896
 Journal of Education, vol VIII
 Journal Royal Asiatic Society, 1906 1907
 J R A S (Bombay Branch), vol XX

- Juvenal
 Kathopanishad
 Kauśika Sūtra—Bloomfield
 Laghumāñjusā—Nagesa Bhatta
 Lalitvistāram—Mitia
 Lancet, 1845
 Latin Translation of Suśruta Samhitā—Hessler
 Mahābhārata—Vyāsa
 Mahānīla Tantra
 Mahāvāgga—S B E
 Mahāvamśa
 Mālavikāgnimitra—Kālidāsa
 Māna Sāra
 Manu Samhitā—Manu (Jones Ed)
 Materia Medica of the Hindus—Dutt
 Medicine in Ancient India—Hoernle (J R A S)
 Memoire Sur L'Inde—Reinaud
 Mesue
 Midwifery—Smellie
 Natural History—Pliny
 Nidāna—Mādhavakṛiṣṇa
 Nīti Sāra—Kāmandakī (Bib Ind)
 Nivandha Samgraha—Dallana
 Obstetric Medicine and Surgery—Barnes
 Operations of General practice—Cornei and pinches
 Operative Surgery—Waring
 Ophthalmic Surgery—Carter
 Ophthalmology—Berry
 Oriental Magazine 1823—Wilson
 Origin and growth of the Healing Art—Bedroo
 Osteology—Hoernle
 Pāṇini—Goldstucker
 Pāṇini—Pāṇini
 Paulus Aegineta—Adams
 Persius
 Pract—Haly Abbas
 Priscianus
 Principle and Practice of Medicine—Francis
 Proceedings A S B 1870
 Rāj Tarāṅginī—Kālhana (Steen's Ed)
 Rāmāyana—Vulmiki
 Rasaratna Samuccaya—Vagbhata III
 Rasendra Cintāmaṇi
 Recentes Decouvertes—Cordier

- Records of Buddhist Religion—I'Tsang (Takakusu's Ed.)
 Rhases
 Report of Wellcome Research Laboratory, vol. III—Balfour
 Researches in Operative Midwifery—Playfair
 Review of the History of Medicine—Wise
 Rg Veda—Maxmüller and Wilson
 Rhinoplastic Operations—Keegan Paul
 Rock Inscriptions of Aśoka
 Sankara Vijaya
 Sāṅkhya and Lākṣa
 Sanskrit Literature—Macdonell
 Śārngadhara Paddhati—Śārngadhara
 Śārngadhara Samgraha—Śārngadhara
 Sarva Darśana Samgraha—Mādhavācārya
 Sarvāṅga Sundarī—Arunadatta
 Śatapatha Brāhmanas—S. B. E.
 Science and Art of Surgery—Erichsen
 Science of Language—Maxmüller
 Senonius
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 Vyākyaṇa Kusumāvalī—Śrīkānta Datta
 Vedārtha Prakāśa—Sāyana
 Veterinary Art—White
 Vienna Oriental Journal Vol. XI
 Viracintāmanī

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described in the ancient books¹ In the later Tantras the origin of the nerves from the spinal cord and the brain is distinctly stated² The ancient Hindus, like the Babylonians, thought the heart to be the seat of the understanding, and the liver as the central organ of the blood The Greeks were the most cultured nation at that age, and the knowledge of the two nations can be compared to our advantage The Hindus did not share with the Greeks the belief that the uterus is "an animal within an animal" and that it can be attracted by pleasant smells and repelled by pungent substances"³ The humoral pathology was also the keystone of the Grecian system The belief in the good and evil spirit was the only alternative to the pathologists when the microscope and the germ theory of diseases were unknown It is highly creditable to the classical Greek physicians for banishing superstition from the practice of the art, but we know that the later Greek writers Aetius, Alexander and Paulus, and the Latin medical literature, were not free from its baneful influence The belief in charms and miracles in the cure of diseases seems to be universal and is

¹ स रस, इत्युच्यते । तस्य च हृदय स्थानं स हृदयाश्चतुर्विंशती धमनीरनुप्रविश्योर्ध्वा दश दश चाधोगामिन्यथतस्तस्मिन्निष्पद्यन्ते शरीरमभ्ररहस्यं पश्यति वर्धयति धारयति यापयति जीवयति चादृष्टहेतुकेन कर्मणा ।

Suśruta Samhitā, I २१४

* द्वे द्वे तिर्यक्गते नाडी चतुर्विंशति सख्यया ।

मीरुदण्डेस्थिताः सर्वे सूते मणिगणादिव ॥

* * *

जलमूलमधःशाखं वृक्षाकारं कलेवरं ।

यथाश्वत्थदली तद्वत् शरीरे नाड्यस्थिताः ॥

Tantra

working even at the present time. Adams says¹ that "considering the faith which many educated persons now repose in the virtues of galvanic rings and garters, the present generation has little ground for laughing at the credulity of our forefathers, with respect to amulets and other phylacteries"

In later times, attempts have been made to substitute other theories in the place of the humoral, and we know with what results "Paracelsus substituted an equally baseless hypothesis, that the fundamental element of the human body were three principles sal, the solid element, quicksilver, the liquid, and sulphur, the aerial. This formula was the badge of the Paracelsist school up to the end of the 17th century" Sylvius and Willh (17th century) of the Iatro-chemical school "referred most diseases to morbid matters or "acrimonies" produced by perverted secretions, and these being sometimes too alkaline, sometimes too acid, the antithesis of acid and alkali became the badge or catch word" of their system. Friedrich Hoffman (1660-1742) constructed another system which "supposed life to be a universally diffused ether, which entering the animal body, became transformed in the brain into Pneuma or nervous fluid. "George Ernst Stahl (1660-1734) believed in the hypothesis of Animism, and "the symptoms of disease were regarded as the conscious efforts of the soul to overcome the morbid influences" William Cullen (1712-90) "propounded a new system of medicine, intended to reconcile the opposing views of his predecessors. Its main feature was the importance attached to the nervous system in the causation of disease" Lastly the "Brunonian" system of John Brown, based on

¹ Adam's Commentary on Paul